Appendix F
Consolidated Remedial Action Workplan

CONSOLIDATED
REMEDIAL ACTION WORKPLAN

HATCO SITE
FORDS, NEW JERSEY

August 18, 2005

Site Location:

HATCO CORPORATION
King George Post Road
Fords, New Jersey 08863

Prepared by:

WESTON SOLUTIONS, INC.
205 Campus Drive
Edison, New Jersey

W.O. No.: 13067.001.001

CERTIFICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Remedial Action Workplan and all attached documents, and based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information, and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.

Typed/Printed Name: _____

Title: Vice President

Signature: _____

Date: _____

Sworn to and Subscribed Before Me on this _____ day of _____ 20___.

_____

Notary

TABLE OF CONTENTS

TABLE OF CONTENTS
(CONTINUED)

Section **Title** **Page**

TABLE OF CONTENTS
(CONTINUED)

Section **Title** **Page**

TABLE OF CONTENTS
(CONTINUED)

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES
(CONTINUED)

LIST OF FIGURES
(CONTINUED)

Please Note: Figure 4-1 has been removed from this report.

LIST OF APPENDICES

Please Note: Appendices D, H, J and K are contained in subsequent volumes that have been previously submitted.

EXECUTIVE SUMMARY

This consolidated Remedial Action Workplan (RAWP) has been prepared by Weston Solutions, Inc. (Weston®) based on the Draft RAWP prepared by URS Corporation for the Hatco Site in Fords, Middlesex County, New Jersey (Site) and incorporates subsequent amendments by both URS and Weston. The RAWP has been prepared in accordance with the New Jersey Department of Environmental Protection (NJDEP) Technical Requirements for Site Remediation (TRSR), the Industrial Site Recovery Act (ISRA) Rules, and the NJDEP Guide for the Submission of Remedial Action Workplans, dated March 1995. In addition, this RAWP incorporates the requirements of the NJDEP February 17, 2005 RAWP approval letter and the USEPA Region 2 March 30, 2005 RAWP approval letter. The March 30, 2005 USEPA letter approved a risk-based remedy for polychlorinated biphenyls (PCBs) at the Site under the Federal Toxic Substances Control Act (TSCA).

In accordance with the settlement agreement between NJDEP, Weston, Hatco and W.R. Grace (the "Settlement Agreement"), Weston has assumed Investigation and Remediation obligations (as defined in the Settlement Agreement) at the Hatco site. Pursuant to the Settlement Agreement, Weston has entered into an Administrative Consent Order with NJDEP, with an effective date of June6, 2005 (the "Weston ACO"), whereby Weston is responsible for the Investigation and Remediation at the Hatco Site. In that regard, and as you may know, the Weston ACO is the document that guides Weston's performance of the Investigation and Remediation at the Hatco site and NJDEP's oversight of the Investigation and Remediation at the Hatco Site. As such, this consolidated RAWP is submitted to NJDEP pursuant to Weston ACO.

The former and current manufacturing operations at the Site are, have been, and continue to be, the production of organic chemicals. During various time periods these chemicals have included phthalic anhydride, plasticizers, benzyl chloride, sebacic acid, capryl alcohol, synthetic lubricants and by-products of these chemicals. In the 1960s, certain of these operations involved the use of heat transfer fluids containing PCBs.

A Remedial Investigation (RI) of the Site has been completed, in accordance with the requirements of an Administrative Consent Order, dated September 9, 1992, between Hatco and NJDEP and NJDEP-approved workplans or the NJDEP TRSR. The results of the RI have defined the limits of soil and groundwater contamination at the Site. PCBs, phthalate esters and benzene are the primary soil contaminants. The highest levels of soil contamination were found in the "Main Production Area" and the former "Muck Area." Low levels of Site-related constituents were identified on off-site properties west and southwest of the Site. Groundwater contamination was detected primarily in the immediate vicinity of a plume of light non-aqueous phase liquid (LNAPL) found in the subsurface at the Site. With minor exceptions, groundwater contamination is not found beyond the Site boundaries. Groundwater contamination is generally limited to the upper water-bearing zone. Investigation of Crows Mill Creek, which is situated west and southwest of the Site, identified the presence of PCBs in the sediment, in addition to other constituents of potential concern with respect to ecological impacts along a defined reach of the creek. The RAWP addresses all Site and off-site areas with exceedances of the applicable NJDEP criteria.

A Remedial Action Selection Report, contained in Section 4, was developed based on Site-specific Remedial Action Objectives (RAOs) for each contaminated medium at the Site. RAOs were developed based on NJDEP and United States Environmental Protection Agency (USEPA) regulations and guidance, and the findings of a Site-specific human health "Receptor Evaluation" and a "Baseline Ecological Evaluation". For all contaminants of concern, the NJDEP Non-Residential Direct Contact Soil Cleanup Criteria were used as RAOs based on current and expected future non-residential use of the Site and the surrounding properties. For PCBs, USEPA regulations, specifically the PCB Mega Rule, were also used as a RAO. Appropriate institutional controls will be incorporated into the remedy to ensure that future land use (industrial) is consistent with the RAOs. Appropriate remedial technologies for each medium were identified to meet the Site-specific RAOs.

The media impacted by Site-related constituents include soil, sediment and groundwater. Due to the potential for the LNAPL to contribute to the localized groundwater impacts, a groundwater remedy is contingent on the remediation of the LNAPL. The groundwater remedy contemplated is natural attenuation; however, due to the presence of LNAPL this groundwater remedy will not be requested at this time. A Classification Exception Area (CEA) with a Well Restriction Area will be requested after further evaluation of LNAPL removal so that a reasonable estimate for the duration of the CEA may be developed.

The proposed remedial action described in this RAWP consists of:

- Excavation and off-site disposal of all soil with PCBs exceeding 500 milligram per kilogram (mg/kg);
- Capping all locations of the Site with PCB concentrations greater than 2 mg/kg (ppm) dry weight, in conjunction with institutional controls for contaminated soil (Deed Notices);
- Excavation and off-site disposal of chemical waste sludges and contaminated sediment overlying the clay layer in the two on-site lagoons; sampling to verify that no material remaining in the lagoons exceeds a concentration of 500 mg/kg (ppm) dry weight PCBs; verifying the integrity of the clay layer and, if necessitated by any observed loss of integrity, restoring the integrity of the clay layer; collapse of the berm separating the lagoons; backfill of the lagoons with soil from other areas of the Site determined to contain less than 500 mg/kg (ppm) PCBs (including areas identified in this RAWP that lie beyond the Hatco property boundary); capping those lagoon backfill materials excavated from other areas of the Hatco Site determined to contain greater than 50 mg/kg (ppm) PCBs with a geotextile of not less than 50 mil thickness and a permeability of not less than 10^{-7} cm/sec; and cover of the lagoon backfill with clean fill to a thickness of not less than 2 feet. Materials excavated from the lagoons shall be managed, including separation of liquid and non-liquid fractions, and disposed of off-site in accordance with PCB disposal regulations contained in 40 C.F.R §761.61(b);
- Removal and capping of contaminated stream sediment in Crows Mill Creek west and southwest of the Site;
- Mitigation of on-site and off-site wetlands impacted by the remedy; and
- Installation and operation of a recovery system to remove LNAPL, to the extent practicable, on the water table from the "Main Production Area" and former "Muck Area" concurrent with excavation and capping activities.

SECTION 1.0
INTRODUCTION

This consolidated Remedial Action Workplan (RAWP) was prepared by Weston Solutions, Inc. (Weston) based on the Draft RAWP prepared by URS Corporation (URS) for the Hatco Corporation (Hatco) facility, located in Fords, New Jersey (Site) (see Figure 1-1). The RAWP was originally drafted on behalf of W.R. Grace & Co.-Conn. (Grace), and Hatco. The Site is currently owned and operated by Hatco. Details concerning Site location, history and background are provided in Section 2 of this RAWP.

In accordance with the settlement agreement between NJDEP, Weston, Hatco and W.R. Grace (the "Settlement Agreement"), Weston has assumed Investigation and Remediation obligations (as defined in the Settlement Agreement) at the Hatco site. Pursuant to the Settlement Agreement, Weston has entered into an Administrative Consent Order with NJDEP, with an effective date of June6, 2005 (the "Weston ACO"), whereby Weston is responsible for the Investigation and Remediation at the Hatco Site. In that regard, and as you may know, the Weston ACO is the document that guides Weston's performance of the Investigation and Remediation at the Hatco site and NJDEP's oversight of the Investigation and Remediation at the Hatco Site. As such, this consolidated RAWP is submitted to NJDEP pursuant to Weston ACO.

URS completed a Remedial Investigation (RI) in accordance with the requirements of the Administrative Consent Order, dated September 9, 1992, between Hatco and the New Jersey Department of Environmental Protection (NJDEP) and NJDEP-approved workplans or the NJDEP Technical Requirements for Site Remediation (TRSR). Three phases of investigation have been performed at the Site (see Section 2). The results of the "Phase I" and "Phase II" investigations have been submitted to NJDEP. The Phase III investigation was completed in accordance with the "Phase II Remedial Investigation Workplan Addendum", as modified by Woodward-Clyde Consultants' letter to NJDEP dated August 6, 1997 (see Appendix B). The results of the Phase III investigation are discussed in Appendix D. Section 3 of this RAWP presents a summary of the results and conclusions of all three phases of investigation, as well as other investigations related to Hatco facility projects.

Section 4 of this RAWP presents the Remedial Action Selection Report (RASR) and a description of the proposed remedy. The RASR defines the Remedial Action Objectives (RAOs) for each contaminated medium at the Site and identifies the appropriate remedial technologies for each medium to satisfy the RAOs. RAOs were developed based on NJDEP and United States Environmental Protection Agency (USEPA) regulations and guidance, and the findings of a Site-specific human health "Receptor Evaluation" and a "Baseline Ecological Evaluation". The RAWP addresses all areas on-site and off-site with exceedances of applicable NJDEP criteria, as reported in the RI.

Section 5 of this RAWP identifies the Institutional Controls that will be required as part of the remedy implementation. Section 6 identifies the reports that will be submitted to document progress and completion of the remedy. Section 7 provides the cost estimate for the remedy. Section 8 provides the implementation schedule. Section 9 provides references.

This RAWP has been prepared in accordance with NJDEP's TRSR (N.J.A.C. 7:26E re-adoption date December 17, 2002, amended February 3, 2003), the Industrial Site Recovery Act (ISRA) Rules (N.J.A.C. 7:26B), the NJDEP Guide for the Submission of Remedial Action Workplans, dated March 1995, and the NJDEP 1998 Revised Guidance Document for the Remediation of Contaminated Soils, dated January 1998. In addition, this consolidated RAWP has been prepared in accordance with the NJDEP February 17, 2005 RAWP approval letter and USEPA Region 2 March 30, 2005 RAWP approval letter. An Administrative Checklist for Remedial Action Workplans is provided in Appendix A. The Certifications required by N.J.A.C. 7:26C-1.2 are provided in a pocket immediately preceding the front cover page.

The media impacted by Site-related constituents include soil, sediment and groundwater. Due to the potential for the light non-aqueous phase liquid (LNAPL) to contribute to the localized groundwater impacts, a groundwater remedy is contingent on the remediation of the LNAPL. The groundwater remedy contemplated is natural attenuation; however, due to the presence of LNAPL this groundwater remedy will not be requested at this time. A Classification Exception Area (CEA) with a Well Restriction Area (WRA) will be requested after further evaluation of LNAPL removal so that a reasonable estimate for the duration of the CEA may be developed.

The proposed remedial action (RA) described in this RAWP consists of:

- Excavation and off-site disposal of all soil with polychlorinated biphenyls (PCBs) exceeding 500 milligram per kilogram (mg/kg);
- Capping all locations of the Site with PCB concentrations greater than 2 mg/kg (ppm) dry weight, in conjunction with institutional controls for contaminated soil (Deed Notices);
- Excavation and off-site disposal of chemical waste sludges and contaminated sediment overlying the clay layer in the two on-site lagoons; sampling to verify that no material remaining in the lagoons exceeds a concentration of 500 mg/kg (ppm) dry weight PCBs; verify the integrity of the clay layer and, if necessitated by any observed loss of integrity, restore the integrity of the clay layer; collapse of the berm separating the lagoons; backfill of the lagoons with soil from other areas of the Site determined to contain less than 500 mg/kg (ppm) PCBs (including areas identified in this RAWP that lie beyond the Hatco property boundary); capping those lagoon backfill materials excavated from other areas of the Hatco Site determined to contain greater than 50 mg/kg (ppm) PCBs with a geotextile of not less than 50 mil thickness and a permeability of not less than 10^{-7} cm/sec; and cover of the lagoon backfill with clean fill to a thickness of not less than 2 feet. Materials excavated from the lagoons shall be managed, including separation of liquid and non-liquid fractions, and disposed of off-site in accordance with PCB disposal regulations contained in 40 C.F.R §761.61(b);
- Removal and capping of contaminated stream sediment in Crows Mill Creek west and southwest of the Site;
- Mitigation of on-site and off-site wetlands impacted by the remedy; and
- Installation and operation of a recovery system to remove LNAPL, to the extent practicable, on the water table from the "Main Production Area" and former "Muck Area" concurrent with excavation and capping activities.

SECTION 2.0
SITE DESCRIPTION

2.1 SITE LOCATION

The Site is located in Woodbridge Township, Middlesex County, New Jersey in the town of Fords, approximately one mile north of the Raritan River. It occupies an area formerly used for clay mining. The Site encompasses approximately 80 acres. It is bounded to the north by King George Post Road and residential properties; to the east by State Highway 440; to the south by Industrial Avenue; and to the west by commercial/industrial properties (Figure 1-1).

2.2 SITE HISTORY

From 1959 until 1978, Grace owned and operated an organic chemical manufacturing facility at the Site. During this period, Grace manufactured phthalic anhydride, plasticizers, benzyl chloride, sebacic acid, capryl alcohol, and synthetic lubricants. These products, as well as raw materials and manufacturing by-products, were stored and handled at the Site. In the 1960s, some of these manufacturing operations involved the use of heat transfer fluids containing PCBs.

From 1961 to 1970, four unlined holding ponds, designated Ponds 1 through 4 (see Figure 2-1), received wastewater from the manufacturing operations. Periodically, semi-solid materials were removed from the bottom of the ponds and placed on the surface soil near the western boundary of the Site, designated the "Muck Area" (see Figure 2-1). Liquid from the ponds was conveyed to a series of trenches that directed the residuals to a tributary of Crows Mill Creek along the west boundary of the Site.

In the mid-1960s, the facility was connected to the local municipal wastewater treatment system, the Middlesex County Utilities Authority (MCUA). Two clay-lined lagoons, designated "Former Lagoons" (see Figure 2-1), were constructed above grade near the southwest corner of the Site to receive effluent from the pond system, recover floating organics, and moderate flow to the MCUA.

In approximately 1964, Grace discontinued use of the sebacic acid and benzyl chloride plants and the capryl and molecular stills. The use of PCBs was discontinued between 1966 and 1970.

In 1970, the four unlined holding ponds were excavated, filled and covered with soil, and a portion covered with asphalt. The production of phthalic anhydride from naphthalene-derived and coal tar-derived feedstocks was discontinued in 1971.

In 1978, Grace sold the facility and the Site to Hatco. Hatco continued to manufacture plasticizers and lubricants and in 1983 began production of z-aspartic acid. In 1990, Hatco constructed an effluent pre-treatment plant. In 1991, two clay-lined lagoons were covered with liners and taken fully out of service.

2.3 SITE SETTING

2.3.1 Surrounding Land Use

The Site is located in a predominantly industrial area. Commercial and industrial properties are located to the west and south. A few residential properties are located to the northwest. State Highway Route 440 and associated connectors are located to the northeast and east of the Site.

2.3.2 Physical Setting

2.3.2.1 Topography and Drainage

The property slopes from an elevation of approximately 60 feet above mean sea level (msl) at the northern boundary to approximately 20 feet above msl at the southern boundary.

Surface water bodies on the Site include an excavated pond and two streams. The pond is located near the center of the east half of the Site and was formed in 1988 by the excavation of contaminated soil from the former Phthalic Anhydride Residue Area (see Table 2-1 and Figure 2-6). The east half of the Site is traversed by Sling Tail Creek which flows from north to south. Crows Mill Creek flows from north to south just beyond and parallel to the western property boundary. A tributary to Crows Mill Creek originates on the property south of the former "Muck Area" and joins Crows Mill Creek near Industrial Avenue. Both Sling Tail Creek and Crows Mill Creek ultimately discharge to a wetland area south of Industrial Avenue.

2.3.2.2 Geology

The Site lies near the northern edge of the Coastal Plain Physiographic Province of New Jersey. This province consists of a wedge of unconsolidated deposits that thickens to the south and east. Beneath the Site are deposits of the lowermost units of the Raritan Formation. Units identified beneath the Site are the Farrington Sand and the Raritan fire-clay. The lithology of these units is variable. The Farrington Sand consists of fine to medium sand interbedded with thin to thick, dark silt beds (Owens, 1995). The Raritan fire-clay is variable in color, and its thickness ranges from zero to 35 feet in this area (Barksdale, 1943). Based on the information provided in boring logs for industrial wells in this area and the Site boring logs, bedrock is estimated to be 45 feet to 70 feet below ground surface (bgs) (Parker, 1993).

The stratigraphy of the Site, as interpreted from information obtained from boring logs for industrial wells located in the area and from the RI conducted at the Site, is as follows:

- Fill with clay or clayey sand; up to 10 feet thick
- Poorly sorted sand with discontinuous dark gray clay layers; 10 to 20 feet thick
- Light gray continuous clay; 2 to 8 feet thick
- Sand and silty sand with clay lenses

A Site-specific stratigraphic cross-section is provided in Figure 2-2.

2.3.2.3 Hydrogeology

A review of historical groundwater level measurements indicates that groundwater exists under water-table conditions (unconfined) within the upper sand layer beneath the Site. At the north end of the Site, where surface elevations are greatest, the depth to groundwater is approximately 24 feet bgs. At the south end of the Site, groundwater is 3 feet or less bgs. Synoptic groundwater measurements indicate that shallow groundwater flows from north to south across the Site (see Figure 2-3).

Several Site monitoring wells are screened within the lower sand/silty sand unit. As described in Section 2.3.2.2, this unit is separated from the upper sand layer by a continuous layer of light gray clay. Based on water level measurements, there are slight differences in water levels in adjacent wells screened above and below the clay layer. This indicates that the clay layer is a confining or semi-confining unit that limits the vertical communication of water above and below it. Based on water level measurements from October and November 1998, the relative difference in water levels in well pairs is not consistent across the Site. Four of the well pairs show a downward gradient, and five sets of well pairs show an upward gradient. Most of the well pairs showing upward gradients (MW-4S and 4D; MW-7S and 7D; B2S and 2D; B25S and 25D) are located near creeks or wetlands that are natural discharge areas. Synoptic water level measurements indicate that the lower water-bearing zone flows from north to south across the Site (Figure 2-4).

2.4 CONCEPTUAL SITE MODEL

Geologic and hydrogeologic data gathered during the RIs were used to develop a physical conceptual model for the Site. The model is depicted in Figure 2-5. The model shows that surface and shallow subsurface releases would migrate downward to the water table in the upper sand unit. Once the constituents reached the water table they would be transported laterally southward. Artificial features including sewer lines and remnants of the former ponds may locally influence horizontal flow. Limited downward vertical transport could also occur but is constrained by the continuous clay layer. If any constituents reached the lower sand unit, they would also be transported laterally southward.

2.5 INVESTIGATION HISTORY

This section provides a chronology of investigatory activities of the areas of environmental concern (AECs) identified at the Site. The complete list of AECs is provided in Table 2-1 and depicted in Figure 2-6. This RAWP evaluates Site-wide contamination and the selected remedies for the Site.

During 1979, 1980 and 1981, NJDEP conducted inspections and collected samples at the Site. In August 1979, NJDEP sampled Crows Mill Creek surface water and collected a sludge sample from a clay-lined lagoon. These results indicated the presence of toluene and trichloroethane. In March 1980, NJDEP sampled the water in the two clay-lined lagoons. These results indicated the presence of toluene, o-xylene and propylbenzene. In August 1980, NJDEP collected surface water samples from the tributary to Crows Mill Creek. These results indicated the presence of benzene and

chloroform. In July 1981, NJDEP collected soil, groundwater and sediment samples to investigate the Site. These results indicated elevated concentrations of several compounds, including volatile organic compounds (VOCs), PCBs and total petroleum hydrocarbons (TPH).

In May 1982, Hatco retained Paulus, Sokolowski and Sartor (PSS) to assist Hatco in the investigation of environmental conditions at the Site in compliance with the requirements of an Amended Administrative Order and Notice of Civil Administrative Penalty Assessment.

Between 1982 and 1986, Hatco conducted groundwater monitoring and implemented investigatory activities to define and characterize contamination at the Site. The results of the groundwater sampling were reported to NJDEP on a quarterly basis. Also, during this period NJDEP conducted inspections of the Site and collected sludge samples from the two clay-lined lagoons and groundwater from monitoring wells at the Site. The results of these investigations indicated the presence of: PCBs; phthalate raw materials, products and by-products; VOCs; certain polynuclear aromatic hydrocarbons (PAHs); raw materials used in the production of benzyl chloroformate; and chlorinated solvents.

In 1986, Hatco retained the services of Dan Raviv Associates, Inc., (DRAI) as environmental consultants for the ongoing investigations. Between 1986 and 1992 several investigations and Interim Remedial Measures (IRMs) were implemented at the Site. For the purpose of investigation and in compliance with NJDEP requirements, the Site was separated into specific AECs. A total of 22 AECs were identified at the Site (see Figure 2-6 and Table 2-1). The investigations conducted during this period included:

- Surface and subsurface soil sampling and analysis throughout the Site;
- Sediment sampling and analysis of Crows Mill Creek and Sling Tail Creek; and
- Sampling and analysis of groundwater from beneath the Site.

IRMs implemented during this period included:

- The excavation and removal of contaminated soil from the former Phthalic Anhydride Residue Area;
- Paving of roadways to divert surface runoff from contaminated or process areas;
- Paving of the surface over two former settling ponds (Pond No. 1 and Pond No. 2);
- Covering the two former lagoons with a synthetic liner; and
- Redirection of surface runoff from the railroad siding area to the effluent pretreatment plant that was constructed.

The scope and results of the investigatory activities and IRMs conducted at the Site are described in reports and other correspondence from Hatco to NJDEP including, but not limited to, the following:

- Progress Report and Proposed Supplementary Soil Sampling – NJPDES Ground Water Discharge Permit #NJ0051551, dated March 1988, prepared by DRAI;
- Summary of Soil and Sediment Investigation, dated July 1989, prepared by DRAI;

- Naphthalene Residue Area, dated October 1, 1989, prepared by DRAI;
- Phthalic Anhydride Process Area, dated November 1989, prepared by DRAI;
- Fill Delineation, dated November 9, 1989, prepared by DRAI;
- Results of Post-Excavation Sampling, dated November 17, 1989, prepared by DRAI;
- Sanitary Sewer Inspection Report, dated March 1991, prepared by Elson T. Killam Associates, Inc.;
- Ground Water Investigations at the Hatco Site – April 1988 to December 1991, dated 1991, prepared by DRAI;
- Draft Remedial Investigation Work Plan, dated August 26, 1992, prepared by DRAI;
- IRM Investigation Report with Recommendation for Interim Actions, dated November 6, 1992, prepared by DRAI;
- Summary of RI/FS Scoping Investigations Results on Soil and Ground Water, dated November 6, 1992, prepared by DRAI;
- Final RI Work Plan and First Quarterly Progress Report, dated February 15, 1993, prepared by DRAI; and
- Draft Feasibility Study Work Plan, dated April 1993, prepared by DRAI.

The Remedial Investigation Report (RIR) dated May 1993, subsequently revised and resubmitted to NJDEP (Revised RIR dated August 1994), presented a comprehensive summary of the results of the environmental characterizations conducted at the Site referenced above and detailed the findings of the RI conducted in 1992 and 1993. The RI consisted of: the completion of 217 soil borings and the collection and analysis of 473 soil samples; the installation and surveying of 12 groundwater monitoring wells; the collection and analysis of 53 groundwater samples, four surface water samples, and nine sediment samples; an investigation of the sewer system; an evaluation of the contaminant fate and transport of PCBs, base neutrals (BNs), and VOCs; an assessment of human health impact; and an archaeological and historical sensitivity evaluation. Based on the results of the soil sampling and analysis, No Further Action (NFA) was recommended for seven of the 22 AECs (9E, 10A, 11A, 16, 17, 18A and 20). In addition, the RIR indicated that soil in AECs 3, 6, 7A, 8, 9B, 9D, 10C, 11B, 13, 14 and 18B were completely delineated.

In conjunction with the RI implemented at the Site, by August 1993 the following IRMs were completed: Project 51A, which addressed PCB contamination at the Hydrotherm Building; Project 52, the Railroad Siding Project; Projects 53, the Scale House Tanks IRM; and Project 51C, the Subsurface Product IRM.

The report entitled The Interim Remedial Measures (IRM) Investigation Report – LNAPL Delineation in the Vicinity of the Hydrotherm Building (Well MW-15s) Project 51U dated December 22, 1994 presented the results of the IRM action consisting of the installation of a product recovery system in well MW-15s. The system operated intermittently from August 1992 to April 1994 and recovered approximately 250 gallons of LNAPL.

The report entitled, Remedial Action Report for Project 57 dated February 1995 provided the results of investigations performed to assess soil quality prior to construction at the following locations: the transformer pad southwest of the alcohol tank farm; the aboveground tanks in the

central and southwest sections of the acid tank farm; the hopper waste pad in the northeast portion of the Site; the reactor located within the main Ester I Process building (AEC-4); the route for the natural gas pipeline; and the Truck Transfer Station. The investigation also included shallow and deep soil sampling and analysis.

The Phase II RIR, dated November 1995, reported the findings of the Phase II RI conducted at the Site in October and November 1994. The RIR detailed the activities and results of the soil, sediment and groundwater sampling program conducted in seven of the 22 AECs previously identified. AECs investigated in the Phase II included AECs 1, 2, 5, 9C, 10A, 19 and the area south of AEC-6. The RI consisted of 46 soil borings, 10 sediment samples from Sling Tail and Crows Mill Creeks and 121 soil samples. In addition, 25 on-site and four off-site monitoring wells were sampled during the Phase II RI.

The Phase II RIR indicated that soil contamination was completely delineated in AECs-5, 9C, 10A, and 19 and that additional delineation in AEC-1 and the area south of AEC 6 was required.

The Phase II RIR recommended additional downstream sediment sampling in Crows Mill Creek (AEC-21A) and no further action (NFA) was recommended for Sling Tail Creek (AEC-21B).

The December 1995 RIR, Ester I Tank Farm, Project 51T, reported the findings of the investigation conducted from March 1994 to March 1995 to investigate the surface seeps observed along the western perimeter of the Ester I Tank Farm (AEC-9A) and southeast of Warehouse No. 4. The activities conducted during the RI for Project 51T consisted of the installation of piezometers, the excavation of test trenches, dye testing, and soil, groundwater and LNAPL sampling and analysis. In addition, an active LNAPL recovery system was implemented. The December 1995 RIR recommended additional monitoring well installation and groundwater investigation.

By correspondence dated August 14, 1996, DRAI provided to NJDEP the results of the Soils Investigation at Warehouse No. 4. The investigation was conducted prior to construction activities in the area and provided the findings of the soil boring and sampling investigation conducted in July 1996. The letter report proposed the excavation and stockpiling of the upper foot of soil due to PCB and BN contamination prior to the initiation of construction activities.

A Remedial Action Report (RAR), dated February 23, 1998, was prepared for field activities conducted at Warehouse No. 2, Warehouse No. 5 and the Ester I Railroad Tank Farm. Warehouse No. 2 was demolished and a new building was erected on the Site. The new structure is referred to as the Ester I Expansion Area. Warehouse No. 5 was expanded by 2,500 ft^2. A new concrete floor and piling were installed in the Ester I Railroad Tank Farm. The RAR summarizes the descriptions of the soil excavation activities, disposal procedures and the completed construction projects.

A Phase III RI was conducted by URS from 1997 through 1999 in accordance with the Remedial Investigation Workplan dated April 1997, as modified by Woodward-Clyde Consultants' letter to NJDEP dated August 6, 1997. The Workplan and modifications were approved by NJDEP in letters dated July 2, 1997, August 26, 1997 and October 10, 1997. The Workplan was developed

based on a Site-wide approach as opposed to segregating the Site into individual AECs. This approach was used to facilitate the development of Site-wide remedies wherever possible. The objectives of the Phase III RI were the delineation of soil, groundwater, sediment and surface water contamination; characterization of the nature and extent of LNAPL; collection of information to support a remedial alternative analysis; collection of information to support a baseline ecological evaluation (BEE); collection of information to support a receptor evaluation; and resolution of NJDEP comments to the Phase II RI detailed in NJDEP's comment letter dated April 22, 1996. Results of the Phase III RI are presented in Appendix D of this RAWP, and included in the summary of Site investigations in Section Three.

All of the AECs listed in Table 2-1 which contain actionable contaminant levels are addressed by the remedies proposed in this RAWP or were previously addressed by the DRAI Remedial Investigation Reports.

SECTION 3.0
SUMMARY OF SITE INVESTIGATIONS

3.1 INTRODUCTION

This section discusses all of the available existing data for the media that have been sampled at the Site. This includes data from investigations conducted in 1987, 1988, 1989, 1990, 1992, 1993, 1994, 1998 and 1999. Detailed presentations of historical data (collected prior to 1998) have been presented in the following reports previously submitted to NJDEP:

- Draft Remedial Investigation Work Plan (DRAI), August, 1992)
- Interim Remedial Measures Investigation Report (DRAI, November 1992)
- Summary of RI/FS Scoping Investigation Results at Hatco Corporation (Project LRI) (DRAI, November 6, 1992)
- Remedial Investigation Report (DRAI, May 1993)
- Revised Remedial Investigation Report, Hatco Corporation, Fords, New Jersey (DRAI, August 1994)
- Addendum to Phase II Remedial Investigation Work Plan for Soil Sampling at the Locations of the Former USTs (DRAI, September 1994)
- IRM Investigation Report, NAPL Delineation in the Vicinity of the Hydrotherm Building (Well MW15S) Project 51U (DRAI, December 1994)
- Remedial Action Report for Project 57 (DRAI, February 1995)
- Addendum to the December 22, 1994 IRM Investigation Report for Project 51U (DRAI, March 1995)
- Phase II RIR (DRAI, November 1995)
- RIR, Ester I Tank Farm, Project 51T (DRAI, December 1995)
- Soils Investigation at Warehouse No. 4 (Project 57) (DRAI letter report, August 14, 1996)

The results of the most recent investigation, the Phase III RI, are presented in detail in Appendix D of this RAWP, and are included in the comprehensive discussions of findings presented in this section.

Most of the historical data (data generated before 1987 were not available) and recent analytical data were compiled into databases that are provided on diskette in Appendix C. These databases were developed for data interpretation purposes, and are not intended to meet NJDEP HAZSITE deliverables requirements. (As per the NJDEP TRSR, Hatco was not obligated to provide data submitted prior to February 18, 1997, in HAZSITE format.) Recent data from the Phase III RI will be provided electronically in HAZSITE format under separate cover.

3.2 SUMMARY OF SITE INVESTIGATIONS

The results of the analytical tests of soil, groundwater, sediment and surface water samples were compared to existing environmental criteria, standards and guidance values established by NJDEP identified below:

- Soil data were compared to NJDEP Residential Direct Contact Soil Cleanup Criteria (RDC Criteria) last revised May 12, 1999;
- PCB soil data were also compared to PCB remediation policy guidelines published in the December 1998 "Site Remediation News";
- Groundwater data were compared to NJDEP's Ground Water Quality Standards (GQS) (N.J.A.C. 7:9-6), adopted January 7, 1993;
- Sediment data were compared to conservative screening values (Lowest Effects Levels) presented in NJDEP's Guidance for Sediment Quality Evaluations, dated November 1998; and
- Surface water data were compared to NJDEP's Surface Water Quality Standards (SWQS) (N.J.A.C. 7:9B), last amended June 20, 2005.

These criteria, standards and guidance were used to determine if Site-related constituents had been delineated and characterized in accordance with the Technical Requirements, N.J.A.C. 7:26E-4.1(b). The data are discussed relative to the above referenced criteria, standards or guidance values in the following sections.

3.2.1 Soil

Because of the industrial history of this Site and the large number of samples that have been analyzed, many constituents have been identified in the soil samples above and below the water table. In most instances, the constituents are detected in only a small number of samples, generally at concentrations less than or close to the applicable regulatory criteria. Rather than attempt to describe every constituent detected at a concentration above the applicable regulatory criteria, representative constituents have been selected for discussion. The basis for selection was the exceedance of one or more soil criteria for 5 percent or more of the samples analyzed. These criteria are the RDC Criteria, the Non-Residential Direct Contact Soil Cleanup Criteria (NRDC Criteria) and the Impact to Groundwater Cleanup Criteria (IGW Criteria). Table 3-1 shows the total number of samples analyzed for each constituent of concern (based on the database provided in Appendix C), the number of samples that exceed a given criterion, and the percentage of the samples analyzed that exceed the criterion. Using these data, the following analytes were selected for discussion: benzene; bis(2-ethylhexyl)phthalate (BEHP); butylbenzylphthalate; di-n-butyl phthalate; di-n-octyl phthalate; PCB Aroclors 1248 and 1254; and TPH.

In general, soil contamination above applicable regulatory criteria is contained laterally within the "Main Production Area" and the former "Muck Area" (see Figure 2-1) and extends to the greatest depth in these areas.

3.2.1.1 Benzene in Soil

Benzene was detected in 118 of the 390 soil samples analyzed for this compound. Detected concentrations of benzene ranged from 0.0006 to 53 mg/kg (see Table 3-1). The locations and distribution of benzene exceeding the NJDEP RDC criterion (3 mg/kg), NRDC criterion (13 mg/kg) and IGW criterion (1 mg/kg) are graphically depicted in Figures 3-1, 3-2, and 3-3 (more detailed maps are provided in Appendix E). As shown in these figures, the delineation of

benzene is complete both on and off Site. In the "Main Production Area" soil exceeding one or more criteria was identified at a maximum depth of approximately 20 feet bgs. In the former "Muck Area" soil exceeding one or more criteria was identified at a maximum depth of approximately 12 feet bgs.

3.2.1.2 Bis (2-ethylhexyl) phthalate (BEHP) in Soil

BEHP was detected in 846 of the 985 soil samples analyzed for this compound. Detected BEHP concentrations ranged from 0.025 to 130,000 mg/kg (see Table 3-1). The locations and distribution of BEHP exceeding the NJDEP RDC criterion (49 mg/kg), NRDC criterion (210 mg/kg) and IGW criterion (100 mg/kg) are graphically depicted in Figures 3-4, 3-5, and 3-6 (more detailed maps are provided in Appendix E). As shown in these figures, the horizontal delineation of BEHP on and off Site is complete. In the "Main Production Area" soil exceeding one or more criteria was identified at a maximum depth of approximately 25 feet bgs. In the former "Muck Area" soil exceeding one or more criteria was identified at a maximum depth of approximately 16 feet bgs.

3.2.1.3 Butylbenzylphthalate in Soil

Butylbenzylphthalate was detected in 526 of the 978 soil samples analyzed for this compound. Detected butylbenzylphthalate concentrations ranged from 0.007 to 31,000 mg/kg (see Table 3-1). The locations and distribution of butylbenzylphthalate exceeding the NJDEP RDC criterion (1,100 mg/kg), NRDC criterion (10,000 mg/kg) and IGW criterion (100 mg/kg) are depicted in Figures 3-7, 3-8, and 3-9 (more detailed maps are provided in Appendix E). As shown in these figures, the horizontal delineation of butylbenzylphthalate on and off Site is complete. In the "Main Production Area" soil exceeding one or more criteria was identified at a maximum depth of approximately 20 feet bgs. In the former "Muck Area" soil exceeding one or more criteria was identified at a maximum depth of approximately 12 feet bgs.

3.2.1.4 Di-n-butylphthalate in Soil

Di-n-butylphthalate was detected in 533 of the 977 soil samples analyzed for this compound. Detected di-n-butylphthalate concentrations ranged from 0.0072 to 17,000 mg/kg (see Table 3-1). The locations and distribution of di-n-butylphthate exceeding the NJDEP RDC criterion (5,700 mg/kg), NRDC criterion (10,000 mg/kg) and IGW criterion (100 mg/kg) are depicted in Figures 3-10, 3-11 and 3-12 (more detailed maps are provided in Appendix E). As shown by these figures, the horizontal delineation of di-n-butylphthalate on and off Site is complete. In the "Main Production Area" soil exceeding one or more criteria was identified at a maximum depth of approximately 20 feet bgs. In the former "Muck Area" soil exceeding one or more criteria was identified at a maximum a depth of approximately 12 feet bgs.

3.2.1.5 Di-n-octylphthalate in Soil

Di-n-octylphthalate was detected in 532 of the 978 soil samples analyzed for this compound. Detected concentrations of di-n-octylphthalate ranged from 0.002 to 13,000 mg/kg (see Table 3-1). The locations and distribution of di-n-octylphthalate exceeding the NJDEP RDC criterion (1,100 mg/kg), NRDC criterion (10,000 mg/kg) and IGW criterion (100 mg/kg) are depicted in

Figures 3-13, 3-14 and 3-15 (more detailed maps are provided in Appendix E). As shown by these figures, the horizontal delineation of di-n-octylphthalate on and off Site is complete. In the "Main Production Area" soil exceeding one or more criteria was identified at a maximum depth of approximately 20 feet bgs. In the former "Muck Area" soil exceeding one or more criteria was identified at a maximum depth of approximately 12 feet bgs.

3.2.1.6 PCBs in Soil

PCBs were detected in 852 of the over 1,200 soil samples analyzed for these compounds. Detected concentrations of individual PCB Aroclors ranged from 0.0033 to 12,000 mg/kg (see Table 3-1). The locations and distribution of total PCBs exceeding the NJDEP RDC criterion (0.49 mg/kg), NRDC criterion (2 mg/kg) and IGW criterion (100 mg/kg) are depicted in Figures 3-19, 3-20, and 3-21 (more detailed maps are provided in Appendix E). As shown by these figures, the horizontal delineation of PCBs on and off Site is complete. In the "Main Production Area" soil exceeding one or more criteria was identified at a maximum depth of approximately 25 feet bgs. In the former "Muck Area" soil exceeding one or more criteria was identified at a maximum depth of approximately 16 feet bgs.

3.2.1.7 Total Petroleum Hydrocarbons in Soil

Total petroleum hydrocarbons (TPH) were detected in 150 of 168 soil samples analyzed for these compounds. Detected concentrations ranged from 5.9 to 160,000 mg/kg (see Table 3-1). The locations and distribution of (TPH) exceeding the NJDEP RDC and NRDC criterion (10,000 mg/kg) are depicted in Figures 3-16, 3-17 and 3-18 (more detailed maps are provided in Appendix E). These figures show that most of the samples containing elevated levels of TPH came from the organic rich sediment in the former lagoons or former ponds. This being the case, the detected TPH concentrations likely reflect the elevated concentrations of Site-specific organic compounds. Further delineation of TPH is not warranted because Site soil have been extensively characterized for individual compounds, which have been delineated.

3.2.2 LNAPL

Figure 3-22 depicts the approximate locations of the 45 temporary piezometers (T-1 through T-45) installed to delineate the lateral extent and to determine thickness of LNAPL present at the Site. This figure also depicts the approximate extent of LNAPL based on information from the 45 temporary piezometers and from selected monitoring wells. Two main areas of LNAPL have been identified. One area extends from the "Main Production Area" southward to just north of the former lagoons. A second area lies within the former "Muck Area." The measured thickness of the LNAPL in wells and piezometers ranged from a sheen to 7.29 feet in these areas. By averaging the measured thicknesses and applying the 4:1 rule of thumb from De Pastrovich et al. (1979) to compensate for accumulated LNAPL trapped within the wells, the following estimated thicknesses were derived:

- North End of Main Production Area Plume – 0.13 foot thick
- South End of Main Production Area Plume – 1.72 feet thick
- Former Muck Area – 0.06 foot thick

Isolated occurrences of LNAPL were also identified in the area of monitoring wells MW-5S, MW-50S and TF1/P12. Monitoring wells MW-50S and TF1/P12 were determined to contain between 1 to 2 feet of LNAPL. However, based on data from surrounding locations, the areal extent of LNAPL at these monitoring well locations is limited. Historically, monitoring well MW-5S has not contained any LNAPL. However, in October 1998, measurable LNAPL was detected in this monitoring well at a thickness of only 0.01 foot.

Historical and recent analytical results indicate that the LNAPL in each of the two major delineated areas is essentially the same (Table 3-2). All of the samples contain the PCB Aroclor-1248 and phthalates and have similar specific gravities and viscosities. Nearly all of the samples contain benzene, toluene and xylenes. LNAPL samples collected during the Phase III RI were subjected to fingerprint analysis and were identified as containing hydrocarbons in the distillation ranges of No. 2 fuel oil and motor oil, but with patterns that do not match the standards for these petroleum products.

3.2.3 Groundwater

Groundwater samples have been collected for chemical analysis throughout the history of investigations at the Site. A comprehensive groundwater sampling event was conducted in late October and early November 1998, with supplemental delineation sampling in 1999 as part of the Phase III RI. The results of the Phase III RI sampling are discussed and presented in detail in Appendix D of this RAWP. The results of historical groundwater sampling events have been presented previously in reports submitted to NJDEP.

Based on the results of the Phase III RI sampling (Appendix D), the following analytes were identified as potentially Site-related constituents of concern in groundwater at the Site:

- Benzene
- Ethylbenzene
- Xylenes
- Dichloromethane
- BEHP
- Di-n-octylphthalate
- PCBs
- Arsenic
- Cadmium

3.2.3.1 Benzene in Groundwater

Benzene was detected at concentrations that exceeded NJDEP's GQS of 1 microgram per liter (ug/L) in 18 of the 39 shallow monitoring wells, piezometers, and monitoring points sampled during the Phase III RI. Detected benzene concentrations that exceed the GQS ranged from 2.3 to 980 ug/L. Benzene was also detected in groundwater samples collected from two of the nine deep monitoring wells at concentrations of 2 and 100 ug/L.

In addition to these data, groundwater data recently collected for the Town of Woodbridge on neighboring properties to the west was also used for delineation. As shown in Figures F-1 and F-2 (Appendix F), the extent of groundwater that contains benzene at concentrations above the GQS has been delineated.

Figure 3-23 presents historical benzene concentrations in shallow groundwater. These data indicate that the location and shape of the benzene plume remained essentially unchanged from 1991 through 1998.

3.2.3.2 Ethylbenzene in Groundwater

During the Phase III RI groundwater sampling event, one of the 39 shallow groundwater samples collected (monitoring well MW-54S) contained ethylbenzene (940 ug/L) at a concentration that exceeded the GQS of 700 ug/L. Ethylbenzene was not detected at concentrations exceeding the GQS in any samples collected from the deep water-bearing zone. As shown in Figures F-3 and F-4 (Appendix F), the extent of groundwater that contains ethylbenzene at concentrations above the GQS has been delineated.

Figure 3-24 presents historical ethylbenzene concentrations in shallow groundwater. These data indicate that prior to 1998, ethylbenzene was not detected above the GQS in any of the monitoring wells sampled.

3.2.3.3 Xylenes in Groundwater

During the Phase III RI groundwater sampling event, one of the 39 shallow groundwater samples collected (monitoring well MW-54S) contained total xylenes (4,700 ug/L) at a concentration that exceeded the GQS of 1,000 ug/L. Xylenes were not detected at concentrations exceeding the GQS in any samples collected from the deep water-bearing zone. As shown in Figures F-5 and F-6 (in Appendix F), the extent of groundwater that contains xylenes at concentrations above the GQS has been delineated.

Figure 3-25 presents historical total xylenes concentrations in shallow groundwater. These data indicate that the location and area in which total xylenes were detected at concentrations above the GQS remained essentially unchanged from 1991 through 1998. The highest concentrations were in the area of the Ester I Tank Farm, Acid Tank Farm and the maintenance building former underground storage tank.

3.2.3.4 Dichloromethane in Groundwater

During the Phase III RI groundwater sampling event, two of the 10 shallow groundwater samples collected (monitoring wells MW-45S and MW-53S) contained dichloromethane (6 and 6.3 ug/L, respectively) at concentrations that exceeded the GQS of 3 ug/L. In accordance with the Workplan, only monitoring wells installed during the Phase III RI were sampled for the full suite of Target Compound List (TCL) VOCs which includes dichloromethane. As shown in Figure F-7 (Appendix

F), the extent of groundwater that contains dichloromethane at concentrations above the GQS has been delineated.

Figure 3-26 presents historical dichloromethane concentrations in shallow groundwater. These data indicate that the location and area in which dichloromethane was detected intermittently at concentrations above the GQS remained essentially unchanged from 1991 through 1998. The highest concentration was reported in the area of the Ester I Building.

3.2.3.5 BEHP in Groundwater

During the Phase III RI groundwater sampling event, BEHP was detected at concentrations that exceeded the GQS of 30 ug/L in 6 of 35 shallow groundwater samples. BEHP concentrations above the GQS ranged from 54 to 2,200 ug/L. Groundwater samples from the deep water-bearing zone did not contain BEHP. As shown in Figures F-8 and F-9 (Appendix F), the extent of groundwater that contains BEHP at concentrations above the GQS has been delineated.

Figure 3-27 presents historical BEHP concentrations in shallow groundwater. These data indicate that the location and area in which BEHP was detected at concentrations above the GQS remained essentially unchanged from 1991 through 1998. The highest concentrations were in the area of the Ester I Tank Farm and the Acid Tank Farm.

3.2.3.6 Di-n-octylphthalate in Groundwater

During the Phase III RI groundwater sampling event, one of the 34 shallow groundwater samples collected (monitoring well MW-19S) contained di-n-octylphthalate (170 ug/L) at a concentration that exceeded the GQS of 100 ug/L. Groundwater samples from the deep water-bearing zone did not contain di-n-octylphthalate at concentrations above the GQS. As shown in Figures F-10 and F-11 (Appendix F), the extent of groundwater that contains di-n-octylphthalate at concentrations above the GQS has been delineated.

Figure 3-28 presents historical di-n-octylphthalate concentrations in shallow groundwater. These data indicate that the location and area in which di-n-octylphthalate has been detected at concentrations above the GQS remained essentially unchanged from 1991 through 1998. The highest concentrations were in the area of the Ester I Tank Farm and the Acid Tank Farm.

3.2.3.7 PCBs in Groundwater

During the Phase III RI groundwater sampling event, the PCB Aroclor-1248 was detected at concentrations that exceeded the GQS of 0.5 ug/L in 12 of the 35 shallow monitoring wells analyzed for total PCBs and five of the 31 shallow monitoring wells analyzed for dissolved PCBs. Reported concentrations of total PCBs above the GQS ranged from 0.56 to 700 ug/L; dissolved PCBs ranged from 0.53 to 83 ug/L. The solubility of PCB Aroclor-1248 is 50 ug/L.

With the exception of the groundwater sample collected from deep monitoring well MW-9D, which reported a total PCB concentration of 4 ug/L, no other exceedances were reported for either total or dissolved PCB analysis of the deep water-bearing zone. As shown in Figures F-12 through F-15

(Appendix F), the extent of groundwater that contains total and dissolved PCBs at concentrations above the GQS has been delineated.

Figure 3-29 presents historical Aroclor-1248 concentrations (total or unfiltered) in shallow groundwater. These data indicate that the location and area in which Aroclor 1248 was detected at concentrations above the GQS has remained essentially unchanged from 1991 through 1998. Concentrations of Aroclor-1248 detected in the 1998 (Phase III) samples were generally lower than those detected previously.

The highest concentrations of both total and dissolved Aroclor-1248 are coincident with areas containing LNAPL (Figure 3-30).

3.2.3.8 Arsenic in Groundwater

Phase III groundwater samples were the only samples collected from the Site that were analyzed for metals. Groundwater samples collected for arsenic analysis were analyzed to evaluate both total and dissolved concentrations. Arsenic was detected at concentrations that exceeded the GQS of 8 ug/L in 15 of the 33 shallow monitoring wells from which samples were analyzed for total arsenic and three of the 31 shallow monitoring wells from which samples were analyzed for dissolved arsenic. Reported concentrations of total arsenic at concentrations above the GQS ranged from 8.18 to 83.7 ug/L; dissolved arsenic ranged from 9.73 to 13.2 ug/L. Groundwater samples from the deep water-bearing zone did not contain either total or dissolved concentrations of arsenic at concentrations above the GQS.

As shown in Figure F-16 (Appendix F), the extent of shallow groundwater that contains total arsenic at concentrations above the GQS has not been delineated. Figure F-17 (Appendix F) shows that the extent of shallow groundwater that contains dissolved arsenic at concentrations above the GQS has been delineated, and is limited to the "Main Production Area". Given the fact that arsenic is not related to current or historic operations at the Site, and given the low levels of dissolved arsenic in the shallow groundwater and the absence of elevated arsenic concentrations in the deep groundwater, further delineation is not warranted.

3.2.3.9 Cadmium in Groundwater

Groundwater samples collected for cadmium analysis were analyzed to evaluate for both total and dissolved concentrations. Cadmium was detected at concentrations that exceeded the GQS of 4 ug/L in four of the 33 shallow monitoring wells from which samples were analyzed for total cadmium. Cadmium is not related to current or historic operations at the Site.

Reported concentrations of total cadmium above the GQS ranged from 23.4 to 36.1 ug/L. Dissolved cadmium was not detected in any of the groundwater samples collected from the shallow water-bearing zone at concentrations above the GQS. Groundwater samples from the deep water-bearing zone did not contain either total or dissolved concentrations of cadmium above the GQS. As shown in Figures F-20 (Appendix F), the extent of total cadmium in shallow groundwater at concentrations above the GQS has been delineated.

3.2.4 Sediment

A total of 42 sediment samples have been collected for chemical analysis from locations in Crows Mill Creek and an adjacent tributary between 1988 and 1998. During this period, samples were also collected from Sling Tail Creek (see Phase II RIR by DRAI, November 1995). Based on these data, DRAI recommended No Further Action with regard to Sling Tail Creek.

Eleven samples collected from Crows Mill Creek in 1988 were analyzed for PCBs. PCBs were detected in all 11 samples. In addition, one sample was analyzed for VOCs. No VOCs were detected. Ten samples were collected in 1992 and analyzed for PCBs. Two were also analyzed for VOCs and semivolatile organic compounds (SVOCs). PCBs and PAHs were detected at concentrations above the Lowest Effects Levels (LELs) presented in the Guidance for Sediment Quality Evaluations (1998). VOCs were detected in one sample in 1992 at low concentrations (less than 0.1 mg/kg). Seven samples collected in 1994 were analyzed for SVOCs and PCBs. PCBs were detected in all seven samples at concentrations above LELs. Four of the seven samples had SVOC analyte concentrations above LELs. Samples collected in 1998 (Phase III RI) were analyzed for benzene, toluene, ethylbenzene and xylene (BTEX), SVOCs, PCBs, TPH, metals, grain size and total organic carbon (TOC). Results of the 1998 sampling showed SVOCs (PAHs), PCBs and metals above the LEL.

Results for all of the sampling events that exceed the LELs are presented on Figures 3-31 through 3-36 discussed below.

3.2.4.1 PAHs in Sediment

Several PAHs were detected in the sediment samples at concentrations exceeding the LELs as summarized below.

Compound	LEL (mg/kg)	Number of Exceedances	Detected Concentration Range (mg/kg)
2-Methylnaphthalene	0.07	6 of 23 samples	0.097 – 8.9
Acenaphthene	0.016	3 of 23 samples	0.14 – 0.91
Anthracene	0.22	2 of 23 samples	0.093 – 0.78
Fluoranthene	0.75	3 of 23 samples	0.046 – 1.2
Fluorene	0.19	3 of 23 samples	0.067 – 2.3
Naphthalene	0.16	3 of 23 samples	0.06 – 0.83
Phenanthrene	0.56	2 of 23 samples	0.063 – 5.8
Pyrene	0.49	5 of 23 samples	0.056 – 0.78
Total PAHs	4	2 of 23 samples	0.056 – 16.84

The distribution of these PAHs in sediment samples in depicted in Figures 3-31 and 3-32.

3.2.4.2 PCBs in Sediment

The PCB Aroclor-1248 was detected in 36 of the 42 sediment samples at concentrations that exceeded the LEL (0.03 mg/kg). These concentrations ranged from 0.054 to 110 mg/kg. The distribution of PCBs in sediment is shown in Figures 3-33 and 3-34.

3.2.4.3 Metals in Sediment

Metals detected in the sediment samples at concentrations that exceeded the LEL included arsenic, cadmium, copper, lead, mercury, nickel, and zinc. The distribution of metals in sediment is depicted in Figures 3-35 and 3-36.

Compound	LEL (mg/kg)	Number of Exceedances	Detected Concentration Range (mg/kg)
arsenic	6	5 of 14 samples	0.741 – 8.33
cadmium	0.6	2 of 14 samples	0.106 – 0.794
copper	16	9 of 14 samples	2.66 – 51.1
lead	31	3 of 14 samples	5.49 – 79.3
mercury	0.2	1 of 14 samples	0.0589 – 0.315
nickel	16	1 of 14 samples	0.654 – 26.3
zinc	120	2 of 14 samples	7.27 – 249

3.2.5 Surface Water

In connection with the investigation of Crows Mill Creek, surface water samples were collected for chemical analysis as part of the Phase III RI. Only these data are reviewed below due to the transient nature of surface water. These samples were collected at five locations where sediment sampling had previously been conducted. Surface water samples were collected in December 1998 and May 1999 to obtain samples representative of "dry" and "wet" weather conditions, respectively. The samples were analyzed for BNs, PCBs, and metals (both total and dissolved), as well as for alkalinity, TOC and hardness.

Surface water sampling results that exceed NJDEP SWQS are presented on Figures 3-37 through 3-40. PCBs and arsenic were the only constituents detected in concentrations above NJDEP SWQS. These results are discussed below.

3.2.5.1 PCBs in Surface Water

The PCB Aroclor-1248 was detected in concentrations above NJDEP SWQS of 0.000244 ug/L in two dry weather surface water samples located adjacent to the Site (0.28 ug/L at sample location SW-4 and 0.47 ug/L at sample location SW-6) and in the sample collected south of Industrial Avenue (0.37 ug/L at sample location SW-7). PCBs were not detected in a field duplicate sample from location SW-7. PCBs were not detected in the farthest downgradient dry weather sample (SW-9). PCBs were not detected in any of the wet weather samples.

3.2.5.2 Arsenic in Surface Water

Surface water samples collected for arsenic analysis were analyzed for both total and dissolved concentrations. The surface water sampling data for arsenic are inconsistent both within and between sampling events and are, therefore, deemed unreliable. Dissolved arsenic was detected in concentrations above NJDEP SWQS of 0.017 ug/L in all but one of the dry weather samples. None of the dry weather samples contained total arsenic above the SWQS. All but one of the wet weather samples contained total arsenic above the SWQS. Only two of the wet weather samples contained dissolved arsenic above the criterion.

The presence of arsenic in the filtered samples (dissolved) but not in unfiltered samples (total) from the dry weather sampling event is directly opposite to the anticipated results. Filtered samples normally contain lower levels of metals than unfiltered samples. Therefore, these data are suspect. As part of the RA, surface water samples will be collected during a dry weather condition and analyzed for both total and dissolved arsenic in an attempt to resolve this inconsistency.

3.2.6 Summary of Distribution of Contaminants

3.2.6.1 Soil

The Phase III RI soil sampling program completed the delineation of Site-related constituents in on- and off-site soil. The primary constituents of concern in soil relative to the applicable NJDEP criteria are PCBs and secondary constituents of concern are benzene and phthalates. The highest levels of contamination are found in the "Main Production Area", and the former "Muck Area." Low levels of Site-related constituents were identified at certain off-site properties situated west of the Site.

3.2.6.2 LNAPL

The extent of LNAPL at the Site has been delineated. Two main areas have been identified: the "Main Production Area" and the former "Muck Area". Both areas appear to contain the same type of LNAPL.

3.2.6.3 Groundwater

Shallow groundwater beneath the Site contains the following Site-related primary constituents in concentrations above the GQS: PCBs. The secondary constituents of concern are benzene, ethylbenzene, xylenes, dichloromethane, BEHP, di-n-octylphthalate, total arsenic and total cadmium. These exceedances are generally confined within the "Main Production Area" and the former "Muck Area". Low levels of benzene and PCBs were also identified in off-site wells situated west of the Site. Deep groundwater beneath the Site contains limited areas of benzene and total PCBs in concentrations above the GQS.

The extent of cadmium and all organic constituents in the groundwater have been delineated. The extent of total arsenic has not been delineated. However, given the low levels of total and dissolved arsenic in the groundwater, the absence of elevated arsenic concentrations in the deep groundwater, and the fact that arsenic is not related to current or historic operations at the Site, further delineation is not warranted.

3.2.6.4 Sediment

Potential constituents of concern in sediment samples collected from Crows Mill Creek were generally detected at low concentrations within the same order of magnitude as the LEL guidance values. However, one deep sediment sample collected adjacent to the Site indicated slightly elevated levels of PAHs and PCBs at concentrations one to two orders of magnitude above the LEL.

3.2.6.5 Surface Water

Only PCBs have been identified as a Site-related constituent of concern, exceeding SWQS in samples from Crows Mill Creek. The PCB Aroclor-1248 was detected at low concentrations (less than 0.5 ug/L) in three of the six surface water samples. The farthest downstream sample did not contain detectable levels of PCBs.

3.3 RECEPTOR EVALUATION

Pathways by which exposure to contaminants at the Site could occur were evaluated. A detailed discussion of the potential for human health exposure is presented in the "Receptor Evaluation" which is provided in Appendix G. A summary of the results of this evaluation, and Site-specific Remedial Action Objectives (RAOs) for protection of human health, are discussed in Section 3.3.1. The potential for ecological exposure was evaluated in the Baseline Ecological Evaluation (BEE) that is provided in Appendix H. The results of this evaluation are summarized in Section 3.3.2.

3.3.1 Human Receptors

This section presents a summary of the Receptor Evaluation that identified potential pathways that could contribute to significant risks to human receptors.

For potential receptors, exposure pathways were considered in the context of a Site Conceptual Exposure Model (SCEM) (see Figure 3-41) that describes potential links between contaminant sources and on-site and off-site receptors. Based on this evaluation, Site-specific RAOs were developed for control or elimination of any potential exposure pathways that could present significant risks to human health.

3.3.1.1 Surface Soil

Potential exposures to surface soil that could occur would be limited primarily to plant workers or construction workers engaged in maintenance work or other activities that may result in direct contact with soil. Local residents are not expected to have significant exposure to surface soil.

Except for construction work, airborne exposure pathways are not considered significant based on the absence of VOCs in the surface soil and the limited potential for fugitive dust generation.

Based upon this analysis, the RAOs for surface soil that will be protective of human health should include:

- Control of potential exposure of workers via direct contact with surface soil;
- Control of potential for airborne transport of fugitive dust from contaminated areas during construction work; and
- Control of potentially contaminated surface water runoff from the Site to Crows Mill Creek.

3.3.1.2 Subsurface Soil

Direct exposure to contaminants in the subsurface soil generally would be limited to future construction workers who may disturb contaminated soil during excavation. Airborne transport of contaminants during uncontrolled construction activities also could result in airborne exposure to Site workers or nearby residents.

Based upon this analysis, the RAOs for subsurface soil that will be protective of human health should include:

- Control of potential exposure of workers via direct contact with subsurface soil; and
- Control of potential for airborne transport of fugitive dust from subsurface contaminated areas during construction work.

3.3.1.3 Groundwater and LNAPL

Under current conditions, direct exposure to contaminated groundwater is not expected because there are no receptors. The area within the vicinity of the Site is supplied with public water. No potable water supply wells are located within a one-mile radius of the Site. Potential exposure to contaminated groundwater and LNAPL could occur during construction activities.

Based upon this analysis, the RAOs for LNAPL and groundwater that will be protective of human health should include the following:

- Control of potential exposure of workers via direct contact with contaminated groundwater and LNAPL;
- Control of potential migration of LNAPL to sensitive environmental receptors; and
- Control of potential exposure via ingestion of contaminated groundwater.

3.3.1.4 Surface Water and Sediment

Exposure to workers or trespassers via surface water and sediment from Crows Mill Creek could occur through dermal contact or incidental ingestion, although such exposures are likely to be of limited frequency and duration.

Based upon this analysis, the RAOs for surface water and sediment that will be protective of human health should include the following:

- Control of potential exposure of workers/ trespassers via direct contact with Crows Mill Creek sediment; and
- Control of potentially contaminated surface water runoff from the Site to Crows Mill Creek, to prevent potential for recontamination of the creek.

3.3.2 Ecological

A BEE was conducted in the area of Crows Mill Creek at the request of NJDEP by letter dated April 22, 1996. The objective of the BEE was to evaluate environmentally sensitive areas and potential ecological exposure pathways for the Crows Mill Creek study area. The only environmentally sensitive areas identified in the BEE were the low and intermediate resource value wetlands on, and in the vicinity of, Crows Mill Creek. The BEE concluded that no comprehensive ecological risk assessment is required based on:

- The limited size and value of the habitats of concern;
- The proposed remedy that will create a barrier to ecological exposure (capping) or remove impacted sediment and replace them with clean fill; and
- The limited nature and extent of residual contamination that will remain after the proposed remedy is in place.

Based on the results of the BEE, no additional RAOs are required to address potential ecological exposure pathways.

SECTION 4.0
REMEDIAL ACTION SELECTION

4.1 OVERVIEW

This section describes the development of Site-specific RAOs to address the contamination defined in the Remedial Investigation, and the development of a Site-wide remedy to meet these objectives.

Section 3 (Summary of Site Investigation) identified several contaminated media on and adjacent to the Site that require remediation. On-site soil contain concentrations of PCBs and phthalate esters, primarily BEHP, above NJDEP soil cleanup criteria in the operating portions of the facility. Certain other contaminants (e.g., certain PAHs and metals) were detected at concentrations in excess of NJDEP soil cleanup criteria; however, elevated concentrations of other contaminants in the on-site soil generally correlate with the elevated concentrations of PCBs and BEHP. Materials in the former lagoons present at the Site contain elevated concentrations of PCBs, BEHP, PAHs and metals. Off-site soil, west of the southwest portion of the facility, contain PCBs and phthalates at concentrations in excess of NJDEP soil cleanup criteria, although at concentrations much lower than those found in on-site soil. Sediments in Crows Mill Creek, west of the Site, contain PCBs and some PAHs and metals at concentrations above ecological screening levels. PCBs were also detected in unfiltered surface water samples from Crows Mill Creek, but not in filtered samples. This indicates that surface water contamination is due to the presence of suspended particulates of sediment. Therefore, contamination in Crows Mill Creek is associated with the sediment. Two areas of LNAPL, containing PCBs, phthalates, and oil-related compounds, are present at the Site. Shallow groundwater in the vicinity of the LNAPL contains elevated concentrations of PCBs, phthalate esters (primarily BEHP) and benzene.

Section 4.2 describes the development of appropriate RAOs and action levels for each of these contaminated media. RAOs considered applicable USEPA and NJDEP regulations and guidance, in conjunction with risk-based goals based on Site-specific evaluations of potential human and ecological exposure pathways. Because PCBs represent one of the primary contaminants in soil at the Site, USEPA regulations and guidance under the Toxic Substances Control Act (TSCA) are applicable. TSCA requirements were met by submittal of the RAWP and a Site-specific Human Health Risk Assessment (HHRA) to USEPA Region 2 for approval (with copy to NJDEP). USEPA has approved the PCB remedy and action levels in their March 30, 2005 approval letter. For other parameters detected in elevated concentrations at the Site, NJDEP TRSR were the primary source of regulations and guidance considered in the development of RAOs. Site-specific risk-based goals (i.e., control of exposure via certain pathways) for remediation were also developed based upon calculations supporting the HHRA, a human health "Receptor Evaluation," and a "Baseline Ecological Evaluation" (BEE).

Section 4.3 discusses selection of an appropriate remedy for each contaminated medium. This section provides a brief review of the remedy evaluation criteria consistent with NJDEP's TRSR. For each medium, this section presents a summary of the nature and extent of contamination requiring remediation based on the RAOs and action levels defined in Section 4.2, and discusses the ability of the proposed remedy to address all applicable RAOs. As demonstrated in Section 4.3, the extent of remediation required to meet the RAOs for groundwater was determined primarily by the

extent of LNAPL. The extent of remediation required to meet the RAOs for soil was determined primarily by the extent of elevated concentrations of PCBs and phthalates (primarily BEHP) in soil at the Site. However, the proposed remedy addresses all parameters exceeding NJDEP NRDC Criteria. The key elements of the remedy are:

- Excavation and off-site disposal of all soil with PCBs exceeding 500 mg/kg;
- Capping all locations of the Site with PCB concentrations greater than 2 mg/kg (ppm) dry weight, in conjunction with institutional controls for contaminated soil (Deed Notices);
- Excavation and off-site disposal of chemical waste sludges and contaminated sediment overlying the clay layer in the two on-site lagoons; sampling to verify that no material remaining in the lagoons exceeds a concentration of 500 mg/kg (ppm) dry weight PCBs; verifying the integrity of the clay layer and, if necessitated by any observed loss of integrity, restoring the integrity of the clay layer; collapse of the berm separating the lagoons; backfill of the lagoons with soil from other areas of the Site determined to contain less than 500 mg/kg (ppm) PCBs (including areas identified in this RAWP that lie beyond the Hatco property boundary); capping those lagoon backfill materials excavated from other areas of the Hatco Site determined to contain greater than 50 mg/kg (ppm) PCBs with a geotextile of not less than 50 mil thickness and a permeability of not less than 10^{-7} cm/sec; and cover of the lagoon backfill with clean fill to a thickness of not less than 2 feet. Materials excavated from the lagoons shall be managed, including separation of liquid and non-liquid fractions, and disposed of off-site in accordance with PCB disposal regulations contained in 40 C.F.R §761.61(b);
- Removal and capping of contaminated stream sediment in Crows Mill Creek west and southwest of the Site;
- Mitigation of on-site and off-site wetlands impacted by the remedy; and
- Installation and operation of a recovery system to remove LNAPL, to the extent practicable, on the water table from the "Main Production Area" and former "Muck Area" concurrent with excavation and capping activities.

The groundwater remedy contemplated is natural attenuation remediation with a CEA; however, due to the presence of LNAPL, this groundwater remedy will not be requested at this time.

Section 4.4 provides additional details concerning the conceptual design and planned implementation of the selected remedy for each medium. This section describes the activities required to implement the remedies, provides details concerning the design of the proposed cap and LNAPL recovery system, and describes measures that will be implemented to mitigate potential adverse impacts associated with implementation of the remedies. Figure 4-2 illustrates the approximate area of the proposed remedy. Details of the proposed remedy are presented in Section 4.4.1. Subsequent URS site figures in this section reflect the previous approximate area of the proposed remedy.

Section 4.5 summarizes anticipated permitting requirements. Section 4.6 identifies post-remediation maintenance and monitoring requirements. Sections 4.7 and 4.8 describe the Health and Safety Plan and the Quality Assurance Plan documents required for implementation of the remediation.

4.2 REMEDIAL ACTION OBJECTIVES AND ACTION LEVELS

RAOs represent Site remediation goals based upon the analysis of potential exposure pathways and consideration of potential risk. The RAOs identify potential exposure pathways for contamination that must be controlled or eliminated to address risks to human health and the environment. The following sections present specific RAOs to achieve these goals for each medium of concern at the Site. RAOs consider applicable regulatory guidance as well as Site-specific issues related to human health and the environment.

4.2.1 On-Site Soil

4.2.1.1 Applicable Regulations and Guidance

Remediation of PCBs. Federal and State regulations provide specific requirements for the remediation of PCB-contaminated soil. The NJDEP NRDC Criteria for PCBs is 2 mg/kg. The USEPA regulates PCB remediation under TSCA and the corresponding regulations known as the PCB "Mega Rule." The Mega Rule permits cover or capping of soil containing PCBs in concentrations greater than 25 mg/kg and removal or treatment of soil presenting a threat to health and the environment, if necessary, based on Site-specific conditions. A Site-specific HHRA has been prepared pursuant to 40CFR 761.61 and has been submitted to the USEPA and NJDEP to support the proposed Site-specific PCB remedy. The USEPA Region 2 has approved the PCB remedy and action levels in their March 30, 2005 approval letter.

Remediation of Other Chemical Parameters. NJDEP's NRDC Criteria were considered for chemical parameters other than PCBs. The NRDC Criteria were used because the Site is currently industrial and non-residential use is expected to continue (i.e., through application of institutional controls). NJDEP's IGW Criteria were not used as action levels to determine the extent of soil requiring remediation. Extensive groundwater monitoring and analysis conducted at the Site has demonstrated that impacts to groundwater quality are attributable primarily to the occurrence of LNAPL, the extent of which has been defined for remediation purposes. Other contaminants in the soil at the Site generally do not adversely impact groundwater quality. Potential impacts to groundwater are discussed more fully in Section 4.3.7.

4.2.1.2 Protection of Human Health

Protection of human health can be achieved by removing, treating, or restricting human exposures to soil exceeding Site-specific action levels to limit or eliminate potential human exposures. Based on the Receptor Evaluation, the following qualitative RAOs were developed for surface soil (i.e., 0 to 2 feet bgs):

- Control of potential exposure of workers via direct contact with surface soil;
- Control of potential for airborne transport of fugitive dust from contaminated areas during construction work; and,

- Control of potentially contaminated surface water runoff from the Site to Crows Mill Creek.

RAOs developed for the subsurface soil (greater than 2 feet bgs) are:

- Control of potential exposure of workers via direct contact with subsurface soil; and
- Control of potential for airborne transport of fugitive dust from subsurface contaminated areas during construction work.

For all parameters except PCBs, the proposed action levels are NJDEP's NRDC Criteria. Consistent with the requirements of the Mega Rule and the PCB Remediation Policy, a Site-specific post-remedy HHRA was submitted for PCBs to USEPA and NJDEP and approved by USEPA. Based on the HHRA, the soil remaining on-site after construction of the proposed remedy will not present an unacceptable threat to human health. The USEPA approval established the action levels for PCBs.

4.2.1.3 Protection of the Environment

Based on the results of the BEE (Appendix H of the RAWP), protection of the environment can be achieved by satisfying the RAOs for protection of human health. Excavation of soil containing greater than 500 mg/kg of PCBs will remove the highest concentrations of PCBs from the Site. Providing a barrier (cover or cap) for areas with elevated concentrations of PCBs and other contaminants presenting threats to ecological receptors will be protective of the environment. A soil cap will eliminate the potential for significant exposure to ecological receptors and thus provide protection of the environment. Appropriate mitigation will be required to minimize loss of habitat, because portions of the proposed remedy will impact existing stream and wetland areas.

4.2.2 Lagoons

4.2.2.1 Applicable Regulations and Guidance

The lagoons will be remediated as outlined in Section 4.1. Waters that have collected in these inactive lagoons must be removed for off-site treatment, or treated to meet applicable discharge criteria. The discharge criteria would either be Middlesex County Utilities Authority (MCUA) pretreatment requirements (for discharge to the publicly owned treatment works [POTW]) or NJDEP Surface Water Quality Standards (SWQS) criteria (for direct discharge).

The lagoon chemical waste sludges and contaminated sediment overlying the clay layer in the two on-site lagoons will then be excavated and disposed off-site. Sampling will be conducted to verify that no material remaining in the lagoons exceeds a concentration of 500 mg/kg (ppm) dry weight PCBs. The integrity of the clay layer will be verified and, if necessitated by any observed loss of integrity, the integrity of the clay layer will be restored. The berm separating the lagoons will be collapsed and the lagoons will be backfilled with soil from other areas of the Site determined to contain less than 500 mg/kg (ppm) PCBs (including areas identified in this RAWP that lie beyond the Hatco property boundary). Those lagoon backfill materials excavated from

other areas of the Hatco Site determined to contain greater than 50 mg/kg (ppm) PCBs will be capped with a geotextile of not less than 50 mil thickness and a permeability of not less than 10-7 cm/sec. The lagoon will then be backfilled with clean fill to a thickness of not less than 2 feet. Materials excavated from the lagoons shall be managed, including separation of liquid and non-liquid fractions, and disposed of off-site in accordance with PCB disposal regulations contained in 40 C.F.R §761.61(b)

4.2.2.2 Protection of Human Health

Removal of all lagoon materials down to the clay layer will be completed, as discussed in Section 4.1. Based on the HHRA, the remedy achieves protection of human health.

4.2.2.3 Protection of the Environment

The USEPA Region 2 has approved the PCB remedy and action levels described in Section 4.2.2.1 in their March 30, 2005 approval letter. Compliance with the New Jersey Pollution Discharge Elimination System (NJPDES) or MCUA requirements for discharge of lagoon water will protect the environment.

4.2.3 Off-Site Soil

Remediation requirements and RAOs for off-site soil are consistent with those for on-site soil (Section 4.2.1). Weston will negotiate appropriate deed notices and land use restrictions with off-site property owners. Weston will provide NJDEP with written proof that the adjacent property owners are willing to place a deed restriction on their property.

4.2.4 Stream Sediment

4.2.4.1 Applicable Regulations and Guidance

Under the Mega Rule, PCB-contaminated sediment are managed in the same manner as contaminated soil.

NJDEP has not promulgated sediment remediation criteria. Given the limited volume of impacted sediment, 1 mg/kg has been selected as an action level for Crows Mill Creek. The BEE addresses potential impacts from PCBs and other contaminants in stream sediment. Based on the results of the BEE, remediation of stream sediment exceeding 1 mg/kg PCBs will address potential impacts associated with other contaminants.

4.2.4.2 Protection of Human Health

Based on the Receptor Evaluation, the following qualitative RAOs were developed for sediment:

- Control of potential exposure of workers/trespassers via direct contact with Crows Mill Creek sediment; and

- Control of potentially contaminated surface water runoff to Crows Mill Creek from the Site to prevent potential for recontamination of sediment.

Remediation of sediment exceeding 1 mg/kg PCBs would be protective of human health, based on NJDEP and USEPA guidance.

4.2.4.3 Protection of the Environment

Based on the results of the BEE, remediation of Crows Mill Creek sediment exceeding 1 mg/kg PCBs would be protective of the environment. Appropriate mitigation will be required to minimize loss of habitat, because portions of the proposed remedy will impact existing stream and wetland areas.

4.2.5 Light Non Aqueous-Phase Liquid

4.2.5.1 Applicable Regulations and Guidance

NJDEP Technical Requirements require removal or treatment of LNAPL from the subsurface when practicable or containment when treatment or removal is not practicable (N.J.A.C. 7:26E-6.1(d)).

4.2.5.2 Protection of Human Health

The RAO for LNAPL is the control of potential exposure of workers via direct contact with LNAPL.

4.2.5.3 Protection of the Environment

Protection of the environment will be achieved by removal or treatment of LNAPL to the extent practicable or containment when treatment or removal is not practicable.

4.2.6 Groundwater

4.2.6.1 Applicable Regulations and Guidance

NJDEP's GQS adopted January 7, 1993 (N.J.A.C. 7:9-6**)** have been used to screen for potential areas of groundwater that may not meet Class IIA aquifer standards, and thus may require the establishment of a Classification Exception Area (CEA). A CEA is an institutional control that designates an area of an aquifer from which groundwater cannot be drawn for potable use for a defined length of time or until the groundwater quality within the area meets the GQS. The need for, and area to be included within, a CEA will be considered following further evaluation of LNAPL removal so that a reasonable estimate for the duration of the CEA may be developed.

4.2.6.2 Protection of Human Health

Based on the Receptor Evaluation, the following qualitative RAOs were developed for groundwater:

- Control of potential exposure of workers via direct contact with contaminated groundwater; and
- Control of potential exposure via ingestion of contaminated groundwater.

4.2.6.3 Protection of the Environment

Ecological receptors do not directly contact groundwater. Surface water monitoring conducted does not indicate any adverse impact of groundwater on surface water resources.

4.3 REMEDIAL ACTION SELECTION

Remedial Actions (RAs) were selected for those areas of contamination that, on the basis of data collected as part of the RI, were determined to contain contaminant concentrations above applicable standards or criteria identified in Section 4.2. RAs are presented for each medium of concern. Based on the history of the Site and the pattern of contamination, the entire Site and related off-site areas are considered a single area of concern for purposes of remediation.

4.3.1 Criteria for Remedial Action Selection

In accordance with the NJDEP TRSR, proposed remedial alternatives were evaluated with respect to the following criteria**.**

4.3.1.1 Protection of Human Health and the Environment

Each alternative was evaluated to determine if it is protective of human health and the environment, based on the following:

- Performance and effectiveness, i.e., ability to meet RAOs and reduce risk;
- Reliability in maintaining compliance with RAOs, i.e., adequacy and reliability of controls for providing continued protection from residuals and contamination remaining after implementation of the remedy;
- Degree to which the proposed alternative reduces toxicity, mobility, or volume through treatment, reuse or recycling;
- Ability to minimize risk and short-term impacts while providing long-term protection, including potential short-term impacts on the community, workers and the environment during implementation of the RA, considering Site-specific conditions; and
- Potential for the remedy to result in injury to natural resources, e.g. wetlands, surface waters and groundwater resources.

4.3.1.2 Implementability

The technical and administrative feasibility of implementing each remedial alternative was evaluated, as well as the availability of goods and services necessary for implementation. The feasibility of implementation of a remedial alternative was based on evaluation of the factors listed below:

- Technical difficulties and unknowns associated with construction and operation of a remedial alternative;
- Reliability of the technology;
- Ease in undertaking additional remedial activities;
- Ability to monitor the effectiveness of the remedial alternative;
- Ability to obtain necessary permits, rights-of-way, etc.;
- Availability of off-site treatment, storage and disposal services, necessary additional resources, services, materials and prospective technologies; and
- Approximate time for implementation.

4.3.1.3 Compliance with Applicable Regulations and Guidance

Each remedial alternative was evaluated with respect to compliance with applicable Federal and State regulations and guidance. If it is determined that regulatory requirements cannot be met, a waiver may be considered if permissible.

4.3.2 On-Site Soil

As discussed in Section 3, PCBs and phthalates represent the predominant soil contaminants at the Site relative to the NRDC Criteria. Other contaminants that exceed the NRDC Criteria less frequently are generally co-located with the PCBs and phthalates. In general, the scope of the proposed remedy was designed to meet RAOs for PCBs and phthalates. The scope was then expanded, as appropriate, to ensure RAOs (exceedance of NRDC Criteria) were met for other chemical parameters. Figure 4-2 illustrates the approximate area of the proposed remedy. Details of the proposed remedy are presented in Section 4.4.1. Subsequent URS site figures in this section reflect the previous approximate area of the proposed remedy.

4.3.2.1 PCBs

The action level for PCBs is 2 mg/kg for soil. The approximate areas exceeding 2 mg/kg are shown in Figure 4-2, included as an attachment. Excavation of all soil containing PCB concentrations greater than 500 mg/kg, as shown in the revised Figure 4-2, in combination with capping of soil, is the selected remedy for surface soil exceeding the action level. The HHRA, submitted to the NJDEP and USEPA in support of the risk-based remedy approval under the Mega Rule, confirms the proposed remedy is protective of human health. No treatment or removal of soil exceeding the IGW Criteria is proposed based on the results of groundwater monitoring, which demonstrates that groundwater has not been significantly impacted by PCBs, likely due to their low solubility and high affinity for natural organic material in the soil matrix. Additional detail demonstrating the relationship between groundwater quality and contaminated soil (none apparent) and LNAPL (probable source of impacts to groundwater) is provided in Section 4.3.7. The data indicates that groundwater impacts related to the presence of contaminated soil are due to the inclusion of soil particles in groundwater samples as opposed to the release of dissolved PCBs.

4.3.2.2 Phthalates

RAOs for phthalates in surface soil are the NRDC criterion. As discussed in Section 3, BEHP is the predominant phthalate ester found in the soil at the Site. Figure 4-3 shows the areas where soil concentrations exceed the NRDC criterion for BEHP. Exceedances for other phthalates generally occur within the same areas. Capping of soil is the selected remedy for surface soil exceeding the RAOs. The phthalate cap area is generally coincident with the area requiring capping to address PCBs. No treatment or removal of soil exceeding the IGW Criteria is proposed based on the results of groundwater monitoring, which demonstrate that groundwater has not been significantly impacted by phthalates, likely due to their low solubility. Additional detail demonstrating the relationship between groundwater quality and contaminated soil (none apparent) and LNAPL (probable source of impacts to groundwater) is provided in Section 4.3.7. The data indicates that groundwater impacts related to the presence of contaminated soil are due to the inclusion of soil particles in groundwater samples as opposed to the release of dissolved phthalates..

One location, northwest of the proposed cap area, reported a BEHP concentration in soil of 530 mg/kg at a depth of 0-2 feet. Other samples in this area did not indicate elevated BEHP concentrations. Because of the limited depth and areal extent of BEHP contamination in this area, the proposed remedy is to excavate these soil to comply with the NRDC criterion of 210 mg/kg. Clean limits will be established by pre-excavation or post-excavation sampling. The excavation area shown in Figure 4-3, approximately 100 by 100 feet, to a depth of 2 feet, was used for planning. Soil excavated from this area would be consolidated with other contaminated soil under the proposed on-site soil cap.

Surficial contamination (0-2 feet) was also detected in two samples in the southeast portion of the Site. Other surficial samples in this area did not indicate elevated BEHP concentrations. Because of the limited depth and areal extent of surficial BEHP contamination in this area, the proposed remedy is to excavate surface soil to comply with the NRDC criterion of 210 mg/kg. Clean limits will be established by pre-excavation or post-excavation sampling. The excavation area shown in Figure 4-3, approximately 100 by 150 feet, to a depth of 2 feet, was used for planning. Soil excavated from this area would be consolidated with other contaminated soil under the proposed on-site soil cap.

One sample just east of this proposed excavation area contained BEHP above the NRDC Criteria value at the 2.5-3 foot depth interval. Surface soil samples overlying this sample were below the NRDC criterion for BEHP. Because the clean surficial soil represent a barrier to routine direct contact with the subsurface soil, no action other than institutional controls is proposed for this location.

One sample from a gravel-covered area in the Alcohol Tank Farm contained BEHP at a concentration (230 mg/kg) slightly above the NRDC criterion (210 mg/kg) (Figure 4-4). All of the other Alcohol Tank Farm samples from the same depth interval (0 – 0.5 ft) are well below the NRDC criterion as shown below.

Sample Location	BEHP Concentration (mg/kg)
102(F/G 4.5)	46 D
A4	0.81
G4.25	230 BD
H4.5	1.6
SB-250	24 D
SB-251	2.9
SB-252	48 D

Based on the low level of the exceedance, and the fact that exposure to soil within the tank farm is extremely limited, no further action is proposed for this location.

4.3.2.3 Other Parameters

As discussed in Section 3 and shown on Table 3-1, other chemical parameters were identified at the Site at concentrations that exceeded the NRDC Criteria. These chemical parameters included:

- arsenic
- benzo(a)anthracene
- benzo(b)fluoranthene
- benzo(k)fluoranthene
- benzo(a)pyrene
- beryllium
- chrysene
- copper
- diethylphthalate
- indeno(1,2,3-cd)pyrene
- lead
- naphthalene
- thallium
- toluene
- total petroleum hydrocarbons
- 1,1,1-trichloroethane
- zinc

With few exceptions, the observed exceedances for these parameters are within the proposed remedy area determined by exceedances of PCBs and phthalates. However, beyond the proposed remedy area there remain a few areas of the Site that have isolated occurrences of these compounds at concentrations that exceed the NRDC Criteria. These isolated occurrences are not addressed by the proposed Site-wide remedy developed to address the primary soil contaminants. Each of these areas, and the additional remediation proposed, is discussed below.

Naphthalene The RAO for naphthalene in surface soil is the NRDC criterion. Figure 4-5 shows the areas where concentrations of naphthalene exceed the NRDC criterion. Capping of soil is the selected remedy for surface soil exceeding the NRDC criterion. The naphthalene cap area is generally coincident with the area requiring capping to address PCBs and phthalates. Surficial contamination was also detected in one sample in the southeast portion of the Site, outside of the cap area. The proposed remedy is to excavate surface soil to comply with the NRDC criterion of 4,200 mg/kg in conjunction with the excavation of the BEHP contaminated soil in this area. Clean limits will be established by pre-excavation or post-excavation sampling. The excavation area shown in Figure 4-3, approximately 100 by 150 feet, to a depth of 2 feet, was used for planning. Soil excavated from this area would be consolidated with other contaminated soil under the proposed on-site soil cap.

No treatment or removal of soil exceeding the IGW Criteria is proposed based on the results of groundwater monitoring, which demonstrate that groundwater has not been significantly impacted by naphthalene.

Arsenic One exceedance of the NRDC criterion for arsenic was reported in the southeastern portion of the Site (see Figure 4-6). This location is in an undeveloped area, removed from facility operations, where the potential for exposure is very limited. The isolated exceedance does not appear to be related to facility operations, since elevated arsenic concentrations are generally not observed in the operating portions of the Site. Notwithstanding, the proposed remedy was modified to include this area. Because of the limited depth and areal extent of arsenic contamination in this area, the proposed remedy is to excavate soil to comply with the NRDC Criterion of 20 mg/kg. Clean limits will be established by pre-excavation or post-excavation sampling. The excavation area shown in Figure 4-6, approximately 100 by 100 feet, to a depth of 2 feet, was used for planning. Soil excavated from this area would be consolidated with other contaminated soil under the proposed on-site soil cap.

Lead One surface soil sample located beyond the limits of the proposed remedy area contained lead at a concentration of 850 mg/kg, which is above the NRDC criterion 600 mg/kg (see Figure 4-7). A duplicate sample from the same location reported lead at a concentration of 61.5 mg/kg. The average of the two samples (456 mg/kg) is well below the NRDC criterion. The location of this sample is in an undeveloped area removed from facility operations, where the potential for exposure is very limited. The isolated exceedance does not appear to be related to facility operations, since elevated lead concentrations are generally not observed in the operating portions of the Site. Based on the low level of the exceedance, the low level detected in the duplicate sample, and the fact that exposure to soil in this area is extremely limited, no further action is proposed for this location.

Benzo(a)pyrene Six surface soil samples located beyond the limits of the proposed remedy area contained benzo(a)pyrene (BaP) above the NRDC criterion (see Figure 4-8). These isolated exceedances do not appear to be related to facility operations, since elevated BaP concentrations are generally not observed in the operating portions of the Site.

Two of these surface soil samples are located southeast of the "naphthalene" area and contained BaP at concentrations substantially greater than the NRDC criterion. Because these values exceed the NRDC criterion by more than an order of magnitude, the area will be excavated to comply with the NRDC criterion. Clean limits will be established by pre-excavation or post-excavation sampling. The excavation area shown in Figure 4-8, approximately 100 by 150 feet, to a depth of 2 feet, was used for planning. Soil excavated from this area will be consolidated with other contaminated soil under the proposed on-site soil cap.

The four other soil sample locations beyond the limits of the proposed remedy where BaP concentrations were reported slightly in excess of the NRDC Criterion are depicted on Figure 4-8. These exceedances range in concentration from 0.94 to 1.8 mg/kg. In each of the four areas, surrounding samples either did not contain detectable levels of BaP concentrations, or contained BaP below the NRDC Criterion. No action other than institutional controls is proposed for these locations for the following reasons:

- The contamination does not appear to be related to facility operations, since elevated BaP concentrations are generally not observed in the operating portions of the facility;

- Similar concentrations of BaP are common in background samples in urban/industrial areas, including historical fill;
- Potential exposure to humans in these areas is limited; and
- Other samples in the vicinity of these isolated low level exceedances are below the NRDC criterion, such that, even if exposure did occur in these undeveloped areas, typical exposures would be below the NRDC criterion.

Other Chemical Parameters As previously discussed, the proposed remedy based on addressing the primary soil contaminants was modified to include isolated exceedances of naphthalene, BaP and arsenic. The modified remedy was reviewed to ensure it addressed the other chemical parameters exceeding the NRDC Criteria. The observed NRDC Criteria exceedances for the other parameters are located within the area addressed by the proposed remedy (capping or excavation/consolidation/capping). Therefore, no further action is required to address the isolated exceedances for any other parameters. Appendix I includes figures documenting that there are no exceedances for other parameters beyond the limits of the proposed remedy.

4.3.2.4 Ability to Meet Remedial Action Objectives

Protection of Human Health and the Environment The proposed on-site soil remedy meets the RAOs established for the Site. Protection of human health will be achieved by restricting human exposure to contaminated soil by excavation and capping of soil as outlined in Section 4.2.1.1 and by filing a Deed Notice. The post-remedy HHRA submitted to NJDEP and USEPA documents that the soil remaining on-site after construction of the proposed remedy do not present an unacceptable threat to human health. With the exception of limited undeveloped areas, the Site's surface and subsurface soil outside of the proposed cap area have been demonstrated to be in compliance with NJDEP's NRDC Criteria. Institutional controls alone will be protective of human health for these limited areas. A Deed Notice will be prepared for those areas of the Site where soil in exceedance of the applicable soil cleanup criteria will remain after implementation of the remedy. The Deed Notice will meet the requirements of N.J.A.C. 7:26E-8.2. The existing fence will be maintained to minimize the potential exposure to trespassers.

Protection of the environment will be achieved through excavation of soil exceeding 500 mg/kg PCBs, with the corresponding reduction in volume of contaminants, and by providing a barrier (cover or cap) for areas with elevated concentrations of PCBs and other contaminants presenting threats to ecological receptors. For on-site soil, the proposed cap will eliminate the potential for significant exposure to ecological receptors, and thus provides protection of the environment.

The proposed remedy is reliable and uses fully demonstrated technologies. The long-term effectiveness of this alternative requires long-term maintenance. With such maintenance, this alternative will be effective in the long term, with minimal residual risk. Performance of this alternative is easily monitored. The long-term maintenance and effectiveness will be evaluated consistent with NJDEP's requirement for a biannual certification.

Implementation of this remedy will require disturbance of on-site wetlands. Applicable permitting and mitigation for disturbance of impacted wetlands will be included in the remedy. Otherwise, implementation will have minimal short-term impacts, which are readily controllable. Other

potential short-term impacts include those resulting from materials handling operations and potential for contact with contaminated soil during clearing, excavation and backfilling, grading and cap installation. Routine construction procedures to minimize erosion and dust generation during construction and to protect construction workers will be implemented to mitigate these potential impacts.

Implementability This remedy can be readily implemented and monitored using standard construction practices.

Regulatory Compliance The proposed remedy is consistent with applicable NJDEP regulations. USEPA has approved the PCB remedy and action levels in their March 30, 2005 approval letter.

Community Impacts The proposed remedy is not expected to have significant adverse impacts on the community and will not require changes in existing land use.

4.3.3 Lagoons

Based on data presented in Section 3, lagoon sediment contain PCBs, phthalates, PAHs and metals above soil action levels. Details of the proposed remedy are presented in Section 4.4.1.

4.3.3.1 Lagoon Remediation

The selected remedy for the lagoons is as follows:

- Excavation and off-site disposal of chemical waste sludges and contaminated sediment overlying the clay layer in the two on-site lagoons; sampling to verify that no material remaining in the lagoons exceeds a concentration of 500 mg/kg (ppm) dry weight PCBs; verifying the integrity of the clay layer and, if necessitated by any observed loss of integrity, restoring the integrity of the clay layer; collapse of the berm separating the lagoons; backfill of the lagoons with soil from other areas of the Site determined to contain less than 500 mg/kg (ppm) PCBs (including areas identified in this RAWP that lie beyond the Hatco property boundary); capping those lagoon backfill materials excavated from other areas of the Hatco Site determined to contain greater than 50 mg/kg (ppm) PCBs with a geotextile of not less than 50 mil thickness and a permeability of not less than 10^{-7} cm/sec; and cover of the lagoon backfill with clean fill to a thickness of not less than 2 feet. Materials excavated from the lagoons shall be managed, including separation of liquid and non-liquid fractions, and disposed of off-site in accordance with PCB disposal regulations contained in 40 C.F.R §761.61(b);

4.3.3.2 Ability to Meet Remedial Action Objectives

Protection of Human Health and the Environment Lagoon capping, in combination with select excavation, meets the RAOs developed for the Site. Capping is consistent with applicable regulations. Protection of human health will be achieved through excavation of all lagoon materials down to the clay layer, with the corresponding reduction in contaminant volume, and by capping of the lagoon areas to limit or eliminate potential human exposures. The HHRA documented that PCB

levels in subsurface sediment in the lagoon area remaining on-site after construction of the proposed remedy do not present an unacceptable threat to human health. A Deed Notice will be prepared for those areas of the Site, including the lagoons, where soil in exceedance of the applicable soil cleanup criteria will remain after implementation of the remedy. The Deed Notice will meet the requirements of N.J.A.C. 7:26E-8.2.

The proposed remedy is reliable and uses fully demonstrated technologies. The long-term effectiveness requires long-term maintenance. With such maintenance, this remedy will be effective in the long term. Performance of this remedy is easily monitored. The long-term maintenance and effectiveness will be evaluated consistent with NJDEP's requirement for a biannual certification.

Implementation will have minimal short-term impacts, which are readily controllable. Potential short-term impacts include those resulting from materials handling operations and potential for contact with contaminated materials during clearing, excavation and backfilling, grading and cap installation. Routine construction procedures to minimize erosion and dust generation during construction and to protect construction workers will be implemented to mitigate these potential impacts.

Implementability The proposed remedy is implementable, using readily available technologies.

Regulatory Compliance The proposed remedy is consistent with applicable regulations. Approval of the remedy by USEPA and NJDEP will be required.

Community Impacts The proposed remedy is not expected to have significant adverse impacts on the community, and will not require changes in existing land use.

4.3.4 Off-Site Soil

As discussed in Section 3, PCBs and, to a limited extent, BEHP represent the predominant contaminants in off-site soil. No exceedances of NJDEP's NRDC Criteria for other parameters were reported in off-site soil. The proposed remediation area addresses PCBs and BEHP. Details of the proposed remedy are presented in Section 4.4.2.

4.3.4.1 PCBs

The action level for PCBs is 2 mg/kg for surface soil in conjunction with an institutional control. Weston will negotiate appropriate deed restrictions with current owners of the off-site properties to ensure that future use will be non-residential. The off-site area exceeding 2 mg/kg PCBs in surface soil is shown in the revised Figure 4-2 (attached). Capping of soil exceeding 2 mg/kg PCBs is the selected remedy for off-site soil exceeding the action level. A risk-based approach, consistent with the Mega Rule, was used to determine whether any surface or subsurface soil required treatment or removal to protect human health. Based on the analysis performed, it was determined that the capping remedy is protective of human health. No soil exceeding the IGW Criteria were identified off Site.

4.3.4.2 Other Parameters

BEHP is the only parameter other than PCBs detected above the NRDC Criteria in off-site soil. The single exceedance of the BEHP criterion is within the remedy area proposed to address the PCB action level exceedances (see Figure 4-3).

4.3.4.3 Ability to Meet Remedial Action Objectives

Protection of Human Health and the Environment The proposed remediation meets the RAOs developed for the Site. Protection of human health will be achieved by restricting exposures to residual soil by capping soil, and implementing institutional controls, including a Deed Notice. For PCBs, the HHRA documented that soil remaining after the proposed capping do not present an unacceptable threat to human health. The one exceedance of the NRDC Criterion for BEHP will be addressed by the proposed cap. A Deed Notice will be prepared for those areas of the Site where soil in exceedance of the applicable soil cleanup criteria will remain after implementation of the remedy. The Deed Notice will meet the requirements of N.J.A.C. 7:26E-8.2.

Protection of the environment will be achieved by providing a barrier (cover or cap) for areas with concentrations of contaminants above NJDEP NRDC Criteria.. The proposed cap will eliminate potential for significant exposure to ecological receptors, and thus provides protection of the environment. Appropriate mitigation will be required to minimize loss of habitat.

The proposed remedy is reliable, and uses fully demonstrated technologies. The long-term effectiveness requires long-term maintenance. With such maintenance, this remedy will be effective in the long term. Performance of this remedy is easily monitored. The long-term maintenance and effectiveness will be evaluated consistent with NJDEP's requirement for a biannual certification.

Implementation of this remedy will require disturbance of wetlands. Applicable permitting and mitigation for disturbance of impacted wetlands will be included in the remedy. Otherwise, implementation will have minimal short-term impacts, which are readily controllable. Other potential short-term impacts include those resulting from materials handling operations and potential for contact with contaminated soil during clearing, grading and cap installation. Routine construction procedures to minimize erosion and dust generation during construction and to protect construction workers will be implemented to mitigate these potential impacts.

Implementability This remedy can be readily implemented and monitored using standard construction practices.

Regulatory Compliance The proposed remedy is consistent with applicable regulations. Approval of the remedy by USEPA and NJDEP will be required.

Community Impacts The proposed remedy is not expected to have significant adverse impacts on the community, and will not require changes in existing land use. Approval of the off-site landowners will be required.

4.3.5 Stream Sediment

As discussed in Section 3, concentrations of PCBs above the action level of 1 mg/kg were detected in Crows Mill Creek stream sediment. In addition, concentrations of PAHs and metals above ecological-based sediment screening levels were also reported. A BEE (see Appendix H) was conducted to evaluate potential ecological impacts and appropriate mitigation for Crows Mill Creek. Details of the proposed remedy are presented in Section 4.4.3.

4.3.5.1 PCBs

As discussed in Section 4.2.4.1, an action level of 1 mg/kg PCBs for Crows Mill Creek sediment was identified. Portions of Crows Mill Creek exceeding the action level are shown on Figures 4-9 and 4-10. Two channels north of Industrial Avenue (referred to as Channels A and B) and a portion of the channel south of Industrial Avenue (referred to as Channel D) contain PCBs above 1 mg/kg. The proposed remedy for off-site soil includes capping (by soil cover) of soil exceeding 2 mg/kg PCBs, and sediment exceeding 1 mg/kg PCBs. Implementation of this remedy will require extensive clearing and regrading of the off-site area just west of the southwest corner of the Site, including the areas adjacent to Channel A and the impacted reach of Channel B. Thus, implementation of the soil remedy will disturb the current drainage patterns. For Channels A and B, the proposed remedy is to cover existing sediment in place as part of the soil cap for the off-site area and to establish new drainage channels in clean soil. Thus, no contaminated sediment from Channels A and B will remain exposed after implementation of the remedy. For Channel D, including the culvert under Industrial Avenue, the proposed remedy will include removal of sediment exceeding 1 mg/kg PCBs. Excavated sediment and soil, if any, will be consolidated under the on-site cap.

4.3.5.2 Other Parameters

Based on the results of the BEE, the proposed remediation for PCBs addresses the primary concerns associated with other contaminants of potential environmental concern in sediment. Therefore no additional remediation for other parameters is warranted.

4.3.5.3 Ability to Meet Remedial Action Objectives

Protection of Human Health and the Environment The proposed remedy is consistent with the RAOs developed for the Site. This remedy is protective of human health by eliminating the potential for human exposure to elevated PCB concentrations in sediment. Establishing new drainage channels to replace Channels A and B, and removal of sediment to 1 mg/kg PCBs in Channel D, is consistent with remedies implemented at other locations in New Jersey and will be protective of the environment. Appropriate mitigation will be required to minimize loss of habitat, because portions of the proposed cap will impact existing wetland areas. Applicable permitting and mitigation for disturbance of impacted wetlands will be included in the remedy, although, with respect to mitigation, consideration should be given to wetland compensation already provided in the Site Natural Resource Damages settlement.

The proposed remedy is reliable, and uses fully demonstrated technologies. The long-term effectiveness of this remedy requires long-term maintenance. With such maintenance, this remedy will be effective in the long term. Performance of this alternative is easily monitored. The long-term maintenance and effectiveness will be evaluated consistent with NJDEP's requirement for a biannual certification.

Implementation will have adverse short-term impacts, including destruction of existing habitat in the stream, temporary diversion of streamflow, and increasing potential for downstream sediment transport during remediation. The remediation activities will be designed and implemented to minimize potential for transport of contaminated sediment. Applicable permitting and mitigation for disturbance of impacted wetlands is discussed in Section 4.4.3. Other potential short-term impacts include those resulting from materials handling operations and potential for contact with contaminated soil during clearing, grading and cap installation. Routine construction procedures to minimize sediment transport, erosion and dust generation during construction and to protect construction workers will be implemented to mitigate these potential impacts. The remedy includes reestablishment of clean drainage channels, which will replace the existing channels. The new drainage channels will be allowed to repopulate naturally to replace the temporary loss of stream habitat.

Implementability. This remedy can be readily implemented and monitored using standard construction practices.

Regulatory Compliance. The proposed remedy is consistent with applicable regulations. Approval of the remedy by USEPA and NJDEP will be required.

Community Impacts. The proposed remedy is not expected to have significant adverse impacts on the community, and will not require changes in existing land use. Approval of off-site landowners will be required.

4.3.6 LNAPL

As discussed in Section 3, there are two areas of LNAPL present at the Site. NJDEP's TRSR require removal or treatment of LNAPL from the subsurface when practicable or containment when treatment or removal is not practicable. As discussed in Section 4.3.6.1, a LNAPL recovery system is proposed to remove the LNAPL to the extent practicable. Details of the proposed remedy are presented in Section 4.4.4.

4.3.6.1 LNAPL Recovery

The two areas of LNAPL at the Site are illustrated in Figure 4-11. The objective of the selected remedy is to remove the LNAPL to the extent practicable. The LNAPL is currently acting as the primary source of benzene, PCB and phthalate contamination of groundwater in its vicinity. The removal of the LNAPL, to the extent practicable, is an integral step for the remediation of groundwater.

The planned method of LNAPL recovery is interceptor trenches constructed hydraulically downgradient of the LNAPL areas. This general approach is similar to that presently in use near Warehouse No. 4. The initial concept for the locations of the trenches is depicted in Figure 4-11. The trench technology is envisioned to remove LNAPL and to limit the volume of groundwater removal, as required to recover LNAPL (less than 5 gallons per minute). Treated groundwater would be discharged to the MCUA. Other options for LNAPL recovery will be considered if necessary to increase the gradient driving the LNAPL to the collection point(s).

4.3.6.2 Ability to Meet Remedial Action Objectives

Protection of Human Health and the Environment The proposed remediation meets the RAOs developed for the Site. The method of removal of the LNAPL is consistent with applicable regulations. Protection of human health will be achieved with the removal and disposal of the LNAPL. The proposed locations of the recovery trenches are in open areas away from the production area.

The proposed remedy is reliable, and uses fully demonstrated technologies. The long-term effectiveness of this alternative requires long-term operation and maintenance. With such operation and maintenance, this alternative will be effective in the long term. Performance of this alternative is easily monitored.

Implementation will have minimal short-term impacts, which are readily controllable. Potential short-term impacts include those resulting from materials handling operations and potential for contact with contaminated soil and LNAPL during clearing, grading and trench installation. Routine construction procedures to minimize erosion and dust generation during construction and to protect construction workers will be implemented to mitigate these potential impacts.

Implementability The proposed remedy is implementable, using readily available technologies.

Regulatory Compliance The proposed remedy is consistent with applicable regulations. Approval of the remedy by USEPA and NJDEP will be required.

Community Impacts The proposed remedy is not expected to have significant adverse impacts on the community, and will not require changes in existing land use.

4.3.7 Groundwater

As discussed in Section 3, various contaminants were detected in the groundwater at concentrations that exceed the GQS. The predominant Site-related groundwater contaminants are PCBs, phthalates (mainly BEHP) and benzene. The LNAPL is the primary source of these groundwater contaminants. Additional organics and metals that were reported at concentrations that exceed the GQS and may be Site related were generally co-located with the three major contaminants and were detected at a low frequency of occurrence. Details of the proposed remedy are presented in Section 4.4.5.

4.3.7.1 PCBs

The distribution of PCBs at the Site shows that LNAPL, not soil contamination, is the primary source of elevated PCB concentrations observed in groundwater samples. This conclusion is based on the following evidence:

- Elevated PCB concentrations in groundwater are found only in the immediate vicinity of the LNAPL plume;
- In areas with high levels of PCBs in soil but no LNAPL, PCB concentrations in groundwater are low; and
- Leachate quality from soil samples subjected to the Toxicity Characteristic Leachate Procedure show minimal impact from PCBs.

Each of these points is discussed in detail below.

Correlation Between LNAPL and Dissolved PCBs Figure 3-29 illustrates the distribution of total (unfiltered) and dissolved (filtered) concentrations of Aroclor-1248 in the groundwater from the Phase III RI sampling events. The figure also depicts the extent of the LNAPL. The distribution of the concentrations can be divided into two distinct areas: concentrations in groundwater located within the extent and immediate vicinity of the LNAPL and concentrations in groundwater outside the extent of the LNAPL. The distribution of the concentrations of PCBs in the groundwater in the filtered samples suggests that the source of PCBs is the LNAPL and not former pond sediment deposited in the former "Muck Area", the former ponds and the on-site lagoons.

As shown in the following table, all filtered groundwater samples outside of the LNAPL area contained less than 1 ug/L of Aroclor-1248. Concentrations of unfiltered PCBs over 0.5 ug/L (the GQS) occurred in only eight monitoring wells outside the extent of the LNAPL plume. The concentrations in these wells range from 0.56 to 13 ug/L. Concentrations of unfiltered PCBs in wells within the LNAPL plume were generally much higher, ranging from 4.1 to 700 ug/L (see table below). Particulate-bound PCBs are relatively immobile in groundwater. Concentrations of total PCBs may reflect small amounts of soil particulate matter incorporated in monitoring well samples. PCBs were detected in soil samples at or near all eight well locations outside the plume.

Aroclor 1248 (ug/L) in Wells Within LNAPL Area			**Aroclor 1248 (ug/L) in Wells Outside of LNAPL Area with >0.5 ug/L**		
WELL	TOTAL	DISSOLVED	WELL	TOTAL	DISSOLVED
MW-19S	700	83	MW-44S	13	0.93
MW-29S	79 J	32	MW-9SR	7.7	0.72
MW-37S	46	No Sample	MW-48S	1.2	0.53 J
MW-33D	4.1	< 0.3	MW-14S	1.2	No Sample
			MW-7S	0.85	< 0.06
			MW-46S	0.84	< 0.061
			MW-45S	0.71 J	< 0.062
			MW-47S	0.56	< 0.06

The results of the unfiltered sample concentrations of PCBs reported for the monitoring wells located within the extent of the LNAPL plume suggest that the elevated values may be due to the

presence of traces of LNAPL in the samples and, as such, do not represent dissolved concentrations. This premise is based on the fact that the analytical results are generally equal to or well above the aqueous solubility of 50 ug/L for Aroclor-1248.

The 0.5 ug/L PCB contour line for filtered samples is roughly coincident with the outline of the distribution of the LNAPL (Figure 3-29). This illustrates that dissolved PCBs in groundwater beneath the LNAPL are not mobile beyond the immediate vicinity of the LNAPL plume. This is to be expected, since the soil organic carbon partitioning coefficient for PCBs is very high (436,516 milliliters per gram [mL/g]) illustrating that the PCBs are essentially insoluble and have a very strong tendency to bind to the organic carbon found in the aquifer materials. The high carbon content of the aquifer (0.6 percent[1]) is ample to bind the PCBs.

Absence of Groundwater Impacts in Contaminated Soil Areas There is other evidence to illustrate that the PCB-contaminated soil in the former "Muck Area", Ponds and Lagoons do not impact the groundwater. Figure 4-12 shows the location of monitoring well MW-46S which is situated adjacent to the former "Muck Area". The figure provides the filtered and unfiltered results for PCBs in the monitoring well and the concentration of PCBs in the surrounding soil above and below the water table. The soil sample locations are directly upgradient of the monitoring well. The concentration of PCBs ranges from 54 to 4,900 mg/kg in the soil. Chemical analysis of a soil sample taken from the 0-2 foot depth interval during the installation of the well reported PCBs at a concentration of 100 mg/kg. The results of the groundwater sampling from monitoring well MW-46S, which is screened from 1 to 11 feet bgs, reported PCB concentrations of 0.84 ug/L for the unfiltered sample and undetected for the filtered sample. This further confirms the immobility of the PCBs, particularly in the carbon rich soil in the former "Muck Area". Groundwater has been moving past and through these contaminated soil for over 40 years; the PCBs present in the soil have not impacted the groundwater. The results confirm that the primary source of PCBs in the groundwater is from the LNAPL rather than PCB contamination in soil.

The institutional controls of a CEA and WRA will be requested, following further evaluation of LNAPL removal so that a reasonable estimate for the duration of the CEA may be developed, as the remedial action for PCBs in groundwater. This is appropriate given the absence of risk posed by the PCBs in the groundwater, the proposed removal of LNAPL, which is acting as an ongoing source of the PCBs in the groundwater, and the low mobility of the PCBs once in the groundwater.

4.3.7.2 BEHP

The distribution of BEHP at the Site shows that LNAPL, not soil contamination, is the primary source of elevated BEHP concentrations observed in the groundwater samples. This conclusion is based on the following evidence:

- Elevated BEHP concentrations in groundwater are generally found in the immediate vicinity of the LNAPL plume; and
- In areas with high levels of BEHP in soil but no LNAPL, BEHP concentrations in groundwater are low.

[1] Percent carbon based on Phase III RI total organic carbon analyses presented in Table D-7 of Appendix D.

Each of these points is discussed in detail below.

Correlation Between LNAPL and BEHP Figure 4-13 illustrates the BEHP concentrations in the groundwater from the Phase III RI sampling events. The figure also depicts the extent of the LNAPL. The elevated concentrations of BEHP are generally found in the immediate vicinity of the northern section of the LNAPL. The distribution of BEHP contamination illustrates that the primary source of the BEHP in groundwater is the LNAPL, and that migration has not occurred beyond the downgradient limits of the LNAPL. In some instances, the concentrations of BEHP reported for the monitoring wells located within the extent of the LNAPL plume suggest that the elevated values may be due to the presence of traces of LNAPL in the samples and, as such, do not represent dissolved concentrations. This premise is based on the fact that some analytical results are well above the aqueous solubility of 400 ug/L for BEHP.

Relatively low levels of BEHP in groundwater beyond the LNAPL plume confirms that BEHP is not mobile in groundwater beyond the immediate vicinity of the LNAPL plume. This is to be expected, since BEHP is not readily soluble in water, and has a high soil organic carbon partitioning coefficient, indicating that BEHP has a very high affinity for the organic carbon in the aquifer. The high carbon content of the aquifer (0.6 percent) is ample to bind up the BEHP.

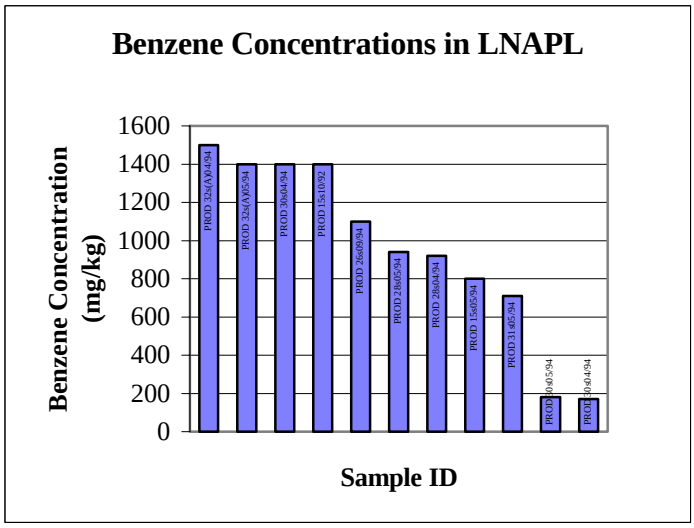
Absence of Significant Groundwater Impacts in Contaminated Soil Areas There are other potential sources of BEHP such as the former pond sediment that were deposited in the former "Muck Area", the former ponds and the on-site lagoons. However, there is no significant groundwater contamination associated with these potential sources. Figure 4-14 shows the location of monitoring well MW-46S, which is situated adjacent to the former "Muck Area". The figure provides the results for BEHP in the monitoring well and the concentration of BEHP in the surrounding soil above and below the water table. The soil sample locations are directly upgradient of the monitoring well. The concentration of BEHP ranges from 490 to 34,000 mg/kg in the soil. The results of the groundwater sample from monitoring well MW-46s reported only 1 ug/L of BEHP in the groundwater. This further confirms the immobility of the BEHP, particularly in the organic carbon rich sediment in the former "Muck Area". The results confirm that the contaminated soil in the former "Muck Area" is not impacting the groundwater in the vicinity and that the primary source of BEHP in the groundwater is from the LNAPL.

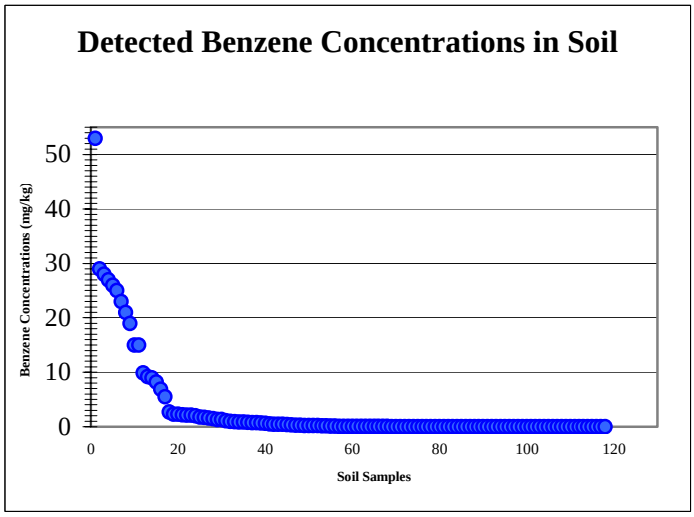
The institutional controls of a CEA and WRA will be requested, following further evaluation of LNAPL removal so that a reasonable estimate for the duration of the CEA may be developed, as the remedial action for BEHP in groundwater. This is appropriate given the absence of risk posed by the BEHP in the groundwater, the proposed removal of LNAPL, which is acting as an ongoing source of the BEHP in the groundwater, and the low mobility of the BEHP once in the groundwater.

4.3.7.3 Benzene

Figure 4-13 illustrates the benzene concentrations in the groundwater from the Phase III RI sampling events. The figure also depicts the extent of the LNAPL. The elevated concentrations of benzene are in the immediate vicinity and downgradient of the LNAPL. The distribution of the benzene contamination suggests that the primary source of the benzene in groundwater is the

LNAPL. Chemical analysis confirms that there is a high concentration of benzene in the LNAPL (up to 1,500 mg/kg) (see Table 4-1 and graph below). As shown below, the highest concentrations of benzene in Site soil are below 55 mg/kg, and most are well below 1 mg/kg. The high concentrations of benzene in LNAPL relative to soil are consistent with the LNAPL acting as the primary source of benzene to the groundwater.





The elevated benzene concentration in groundwater north of the production area (570 ug/L) may be residual contamination associated with the removal of an underground storage tank (UST) in this area over 10 years ago.

Benzene is highly biodegradable and rarely is found in groundwater more than a few hundred feet downgradient from a source area. This is consistent with the distribution of benzene observed at the Site. The LNAPL has existed at the Site for 15 to 40 years and benzene has migrated only about 500 ft from the LNAPL plume.

The proposed remedial approach is to remove the LNAPL, which is the likely source of the benzene, to the extent practicable. The institutional controls of a CEA and WRA will be requested, following further evaluation of LNAPL removal so that a reasonable estimate for the duration of the CEA may be developed, as the remedial action for benzene in groundwater. This is appropriate as the attainment of the GQS for benzene will not be possible until the source is addressed. Following further evaluation of LNAPL, additional measures including natural attenuation will be evaluated to address residual benzene contamination in the groundwater.

4.3.7.4 Other Parameters

As discussed in Section 3, other potentially Site-related parameters exceeded the GQS. These parameters included:

- Ethylbenzene
- Xylenes
- Dichloromethane
- Di-n-octylphthalate
- Arsenic
- Cadmium

Ethylbenzene and xylenes were reported at concentrations that exceeded the GQS at only one monitoring well, MW-54S. This monitoring well is located downgradient of the location of a former UST that was removed over 10 years ago. These exceedances are within the benzene plume. However, ethyl benzene and xylenes have not migrated with groundwater to the same extent as the benzene, likely due to the fact that they are less mobile than benzene in groundwater, and also readily biodegrade. The GQS exceedances would fall within the area of the CEA defined by the extent of the benzene plume. This monitoring well will be included in the natural remediation proposal.

Dichloromethane exceeded the GQS in two monitoring wells, MW-45S and MW-53S. The monitoring wells are located in the area of the proposed CEA. These two monitoring wells will be included in the natural remediation proposal.

Di-n-octylphthalate exceeded the GQS in one monitoring well, MW-19S. As for BEHP, the institutional controls of a CEA and WRA will be requested, following further evaluation of LNAPL removal so that a reasonable estimate for the duration of the CEA may be developed, as the remedial action. This is appropriate given the absence of risk posed by the one GQS exceedance of di-n-octylphthalate, the proposed removal of LNAPL which is acting as an ongoing source of the di-n-octylphthalate in the groundwater, and its low mobility once in the groundwater.

Arsenic exceeds the GQS in a number of monitoring wells located primarily within the area of the LNAPL plume. Arsenic is not related to current or historic operations at the Site. The proposed CEA and WRA will include the areas containing arsenic exceedances.

Cadmium exceeds the GQS in monitoring wells primarily in the central portion of the Site. Cadmium is not related to current or historic operations at the Site. The proposed CEA and WRA will include the areas containing cadmium exceedances.

4.3.7.5 Ability to Meet Remedial Action Objectives

Protection of Human Health and the Environment The proposed remediation (source/LNAPL removal to the extent practicable and natural remediation with institutional controls) meets the RAOs developed for the Site. The proposed CEA is consistent with the applicable regulations. Protection of human health will be achieved by restricting human consumption of contaminated groundwater in the CEA.

The proposed remedy is reliable. The long-term effectiveness of this alternative requires long-term monitoring. With such monitoring the alternative will be effective. Performance of this alternative is easily monitored.

Implementation will have no short-term impacts.

Implementability The proposed remedy is implementable, using readily available technologies.

Regulatory Compliance The proposed remedy is consistent with applicable regulations.

Community Impacts The proposed remedy is not expected to have significant adverse impacts on the community, and will not require changes in the existing land use.

4.4 DESCRIPTION OF REMEDIAL ACTION

4.4.1 On-Site Soil Cap (Including Lagoon Area)

The on-site soil remedy provides for excavation of soil containing PCB concentrations greater than 500 mg/kg and capping of soil exceeding the action levels developed for the Site as described in Section 4.3.2. In limited areas of the Site, where soil contamination is isolated and shallow, surface soil will be scraped or excavated, and will be consolidated under the on-site cap. Other soil and sediment, for example sediment from Channel D and soil from the perimeter of the cap with PCBs below 500 ppm, may also be placed into the lagoons. In areas where PCB contamination exists above 500 mg/kg, soil will be excavated for off-site disposal. Lagoons will be remediated as outlined in Section 4.3.3. After dewatering and excavation, the lagoons will be backfilled to final grade with certified clean fill. Figure 4-2 illustrates the on-site areas that will be covered by a cap and those that will be excavated and consolidated under the cap. The final boundaries between the different types of cap will account for Site-specific conditions, and will be specified in the detailed design. Implementation of the remedy will include the following elements:

- Clearing currently vegetated portions of the proposed excavation and/or cap areas;
- Excavation of all soil containing PCB concentrations greater than 500 mg/kg for off-site disposal; excavation, and off-site disposal of all lagoon materials above the clay layer;

- Backfilling the excavated areas with certified clean fill as necessary;
- Capping the areas above the action level of 2 mg/kg with appropriate cover material as described in Figure 4-15 (Cap Cross-Sections) and Sections 4.4.1 through 4.4.3 of this RAWP.
- Excavating areas of limited surficial contamination in portions of the Site, with consolidation of the removed materials under the cap area in the southeast portion of the Site;
- Providing appropriate grading for drainage and storm water runoff control, as needed;
- Reseeding (grass) areas capped by soil;
- Providing for maintenance of the cap;
- Providing mitigation/compensation for wetlands impacted by capping; and
- Providing institutional controls, such as deed notices with future land use restrictions.

See the revised Figure 4-2, attached, for excavation area details.

This remedy would be implemented after installation of the LNAPL recovery system and lagoon capping is completed.

4.4.1.1 Open (Unpaved) Areas

Currently the conceptual remediation plan is for open, unpaved vegetated areas to be capped by a soil cover with a total thickness of 18 to 24 inches. Areas where PCB concentrations exceed 500 mg/kg will be excavated and backfilled with certified clean fill prior to cap installation. Where appropriate and as approved by NJDEP and USEPA the soil cap thickness and areal extent may be modified. The final specifications of the soil cover will be prescribed in the detailed design. Soil cover was selected for open areas of the Site as the best method for achieving RAOs for the following reasons:

- The proposed soil cover is consistent with NJDEP guidance;
- The proposed soil cover will control potential exposure of workers and trespassers via direct contact with surface soil;
- The proposed soil cover will control potential for airborne transport of fugitive dust from contaminated areas;
- The proposed soil cover will minimize the potential for contaminated surface water runoff from the Site to Crows Mill Creek;
- The proposed soil cover will minimize additional storm water runoff that would be generated by impermeable surfaces; and
- As discussed in Section 4.3.7, groundwater monitoring data indicate that soil contaminants are tightly bound to the soil, and are not adversely affecting groundwater quality; therefore, an impermeable cap to minimize infiltration of rainwater is not necessary.

The top six inches of the cover will be topsoil, and will be reseeded to establish a permanent grass cover that will be maintained. Figure 4-2 illustrates the approximate areas to be capped. The final boundaries between the different types of cap will account for Site-specific conditions, and will be

specified in the detailed design. A typical cross-section for the proposed soil cover is provided in Figure 4-15.

4.4.1.2 Gravel and Paved Areas

Typically, areas currently covered by gravel will be upgraded to provide a minimum thickness of 6 inches of asphalt, consistent with current NJDEP and USEPA guidance. Generally, areas currently covered by asphalt will be capped by a fresh 3-inch layer of asphalt. Asphalt pavement was selected for cover in these areas based on Hatco's current operations, which allow for vehicular traffic in these areas. Figure 4-2 illustrates the approximate areas to be capped. The final boundaries between the different types of cap will account for Site-specific conditions, and will be specified in the detailed design. A typical cross-section for the proposed asphalt cover is provided in Figure 4-15.

4.4.1.3 Buildings and Structures

A small portion of the proposed cap area is currently covered by existing buildings and structures (e.g., tank farms, concrete pads). These areas already provide effective cover of underlying soil. These areas will be inspected and maintained pursuant to the Deed Notice.

4.4.1.4 Permit Requirements

Approximately 2.6 acres of on-site wetlands will be impacted through the installation of the cap. Therefore, a Freshwater Wetlands GP-4 permit will be required. This permit will require mitigation for all wetlands impacted during the remediation. Mitigation would likely be required at a 1:1 area ratio for "ordinary" wetlands. This alternative will also require a Soil Erosion and Sediment Control Plan (SESC Plan), a Stormwater Construction Permit and would likely require a Stream Encroachment Permit. Depending on local requirements, Site Plan approval may also be required.

4.4.2 Off-Site Soil Cap

The off-site soil remedy provides for placement of a cap or soil cover over areas exceeding the PCB action level (2 mg/kg). The key elements include:

- Clearing currently vegetated portions of the proposed cap area;
- Capping the areas above the action level with a soil cover;
- Providing appropriate grading for drainage and stormwater runoff control as needed. Clean drainage channels will replace existing Channels A and B of Crows Mill Creek;
- Reseeding (grass) areas capped by soil;
- Providing for maintenance of the cap;
- Providing compensation for wetlands impacted by capping and associated remediation activities; and
- Providing institutional controls, such as deed notices, future land use and restrictions.

The approximate extent of areas requiring capping is shown on Figure 4-2. The off-site cap would be implemented in conjunction with the on-site cap.

4.4.2.1 Permitting Requirements

Because the cap extends over or adjacent to existing Channels A and B of Crows Mill Creek, these channels and adjacent wetlands will be impacted by the remediation. Approximately 1.4 acres of off-site wetlands would be impacted. Therefore, a Freshwater Wetlands GP-4 permit will be required. This permit would require mitigation for all wetlands impacted during the remediation. Mitigation requirements will be reviewed with NJDEP. This alternative would also require a SESC Plan, and a Stream Encroachment Permit (See Section 4.5). Depending on local requirements, Site Plan approval may also be required.

4.4.3 Stream Sediment

Crows Mill Creek stream sediment both north and south of Industrial Avenue have been impacted by low levels of PCBs. Because the impacted creek channels north of Industrial Avenue are within an area of soil contamination, while those south of Industrial Avenue are not, the proposed remedy for sediment is location dependent. Remediation of downstream sediment (i.e., Channel D) would follow remediation of upstream areas to minimize the potential for recontamination of remediated areas.

4.4.3.1 North of Industrial Avenue (Channels A and B)

As shown on Figure 4-2, Crows Mill Creek Channels A and B are located within the approximate area of the proposed off-site soil cap. Because there is dense vegetation in this area, significant clearing and regrading will be required to install the soil cap. Because Channels A and B are small, construction work required to clear and regrade this area will significantly impact or destroy Channels A and B. It is therefore proposed that Channels A and B will be covered in place during installation of the soil cap, and that a new clean drainage channel will be established to replace Channels A and B. Key elements of this remedy include:

- Temporarily rerouting stream flow;
- Clearing vegetation;
- Providing an in-place soil cap for existing sediment consistent with soil cover in this area;
- Regrading the area to provide a new clean drainage channel;
- Providing appropriate gravel/stone fill for the new drainage channel to prevent erosion;
- Re-vegetation;
- Allowing natural repopulation to reestablish habitat in the new stream channel; and
- Providing institutional controls, such as deed notices with future land use restrictions.

4.4.3.2 South of Industrial Avenue (Channel D)

Impacted sediment would be removed from the culvert under Industrial Avenue, and from Channel D south of Industrial Avenue. The extent of sediment to be removed is shown on Figure 4-9. Sediments removed from the creek would be stabilized or dewatered, as necessary, to improve their structural characteristics prior to placement under the on-site cap. The need for stabilizing sediment will be determined in the field. If the sediment are too wet and soft to allow for grading and cap

placement, addition of granular material (e.g., sand or gravel) or absorbents (e.g., flyash) will be considered to improve the structural properties of the sediment. Because PCB concentrations in these sediment are well below 50 mg/kg, this material can be consolidated in the on-site lagoons prior to final cover. Key elements of the remedy include:

- Temporarily rerouting streamflow;
- Excavating or dredging sediment above the action level;
- Creating a temporary storage area for excavated sediment;
- Dewatering or stabilizing sediment, if necessary, to improve their structural characteristics;
- Transporting sediment to the on-site lagoons;
- Replacing removed material with gravel;
- Re-vegetation; and
- Allowing natural repopulation to reestablish habitat in the stream.

4.4.3.3 Permitting Requirements

Remediation of stream sediment will require the following permits:

- NJ Stream Encroachment Permit;
- NJ Freshwater Wetlands – State Open Water Permit GP-4;
- 401 Water Quality Certificate; and
- SESC Plan.

4.4.4 LNAPL

4.4.4.1 Description of Remedy

NJDEP Technical Requirements require that LNAPL be removed or treated to the extent practicable or contained when treatment or removal is not practicable. The proposed method of remediation is the installation of recovery trenches, in addition to the existing system located adjacent to Warehouse No. 4. The approximate location of the recovery trenches is illustrated in Figure 4-11. The key components of this remediation are intended to include:

- Installing two collection trenches downgradient of LNAPL areas, and one further upgradient to intercept transport of LNAPL from beneath the existing Hatco plant;
- Collecting LNAPL and associated water in a tank; an average LNAPL recovery rate of 0.02 gallons per minute (gpm) for up to 14 years was assumed for planning purposes;
- Separating LNAPL from water in an oil/water separator;
- Treating water with activated carbon prior to discharge to the MCUA (discharge to surface water may be required if MCUA does not approve discharge). Discharge locations to be determined in the field;
- Collecting LNAPL for subsequent off-site disposal (or on-site treatment if feasible); and
- Disposing of recovered LNAPL.

LNAPL remediation will be conducted concurrent with excavation activities. LNAPL will likely be treated and disposed of off-site by incineration in a TSCA/Resource Conservation Recovery Act (RCRA) permitted facility. Other LNAPL remedial options are being considered and may replace the trench option prior to the onset of Site remedial construction, if feasible.

4.4.4.2 Permitting Requirements

LNAPL recovery will require the following permits or plan approvals:

- Trench construction will require a SESC Plan;
- A Freshwater Wetlands Permit GP-4 will be required if wetlands are impacted;
- MCUA approval for discharge of treated groundwater (POTW discharge);
- NJPDES DWS permit (surface water discharge only);
- Recovered LNAPL may be subject to NJ Hazardous Waste and TSCA regulations for storage and treatment (no additional permit required);
- Air permit as appropriate under NJAC 7:27-8 or NJAC 7:27-22 if LNAPL/groundwater treatment is necessary; and,
- Temporary storage, if necessary, must comply with N.J.A.C. 7:9 (no additional permit required) and TSCA regulations (no additional permit required although Notification of PCB activity may be required).

4.4.5 GROUNDWATER

4.4.5.1 Description of Remedy (to be proposed)

The institutional controls of a CEA and WRA will be requested, following further evaluation of LNAPL removal to the extent practicable so that a reasonable estimate for the duration of the CEA may be developed, as the remedial action for groundwater is based upon natural attenuation.

The key components of this alternative include:

- Institutional controls, including a CEA to restrict groundwater usage in the impacted area and a WRA;
- Eliminating continuing sources of groundwater contamination through on-site remediation, including LNAPL removal to the extent practicable and capping contaminated soil; and
- Monitoring groundwater quality over time.

4.4.5.2 Permitting Requirements

No permits are required, with the exception of monitoring well permits, if additional monitoring wells are required.

4.5 REQUIRED PERMITS

The following permits may be required, to implement the proposed remedy.

Permit	Actions Triggering Permit
Freshwater Wetlands General Permit (GP-4)	Fill/capping of on-site wetlands Fill/capping of off-site wetlands Stream sediment remediation Construction of LNAPL recovery trenches
Soil Reuse Plan (contained in Appendix M)	Reuse of excavated soil and sediment in former lagoon
SESC Plan	On-site soil excavation, grading, capping Lagoon capping Off-site soil excavation, grading, capping Stream sediment remediation Excavation for LNAPL recovery trenches
Stream Encroachment Permit.	Flow diversion, disturbance or regrading or fill of on-site Channel A Flow diversion, disturbance or regrading or fill of off-site Channel B and D Stream sediment remediation
NJPDES DSW Permit	Would be required if treated waters are discharged to surface water
MCUA approval	Would be required if treated waters are discharged to POTW
401 Water Quality Certificate	Stream sediment remediation
Monitoring Well Permits	Would be required if additional monitoring wells are installed
Local Site Plan approval	May be required for on-site or off-site construction activities
Air permit	Under NJAC 7:27-8 or NJAC 7:27-22 if LNAPL/groundwater treatment is necessary

A detailed schedule for permit applications will be developed as the project is developed.

4.6 POST-REMEDIATION MAINTENANCE AND MONITORING

The continued effectiveness of the remedy will require periodic maintenance and monitoring as described below. A Site Restoration Plan and Remedial System Dismantling Plan will be developed during the design phase of the project.

4.6.1 Cap Maintenance

Maintenance of the cap will be required in accordance with Section 7:26E-8.4 and 7:26E-8.7 of the TRSR.

4.6.1.1 Soil Cover

Routine maintenance of the portions of the cap composed of soil cover will be performed to maintain an effective grass/vegetation cover. Periodic mowing will be conducted to prevent growth of trees or shrubs that could penetrate the cover layer. Reseeding will be performed as necessary to prevent bare areas that could allow erosion of the cover.

Annual inspections will be performed to insure that the cover is in good condition. Appropriate corrective action will be implemented if evidence of erosion or degradation of the cover is observed.

4.6.1.2 Asphalt Pavement Cap

Routine maintenance of the asphalt cap portions of the Site cap will include inspections of the paved areas to ensure that the asphalt is in good condition. The asphalt cap is designed to prevent exposure to underlying soil and is not intended to represent an impermeable barrier; therefore, minor cracks will not require corrective action. Appropriate corrective action (patching or repaving) will be implemented if evidence of significant degradation of the asphalt cap is observed.

4.6.1.3 Deed Notice

Inspections pursuant to Section 7:26E-8.5 of the TRSR will be performed to ensure that land use (on-site and off-site) is consistent with the non-residential land use incorporated into the remedy. Biennial certifications pursuant to Section 7:26E-8.5(c) will be filed to document compliance with the TRSR.

4.6.2 Groundwater Monitoring

A groundwater monitoring program will be initiated after the removal of the LNAPL to the extent practicable. The monitoring program will be modified, as appropriate, if additional groundwater remediation measures are identified as necessary after the LNAPL source has been removed.

4.7 HEALTH AND SAFETY PLAN

A Site-specific HASP to address all remediation activities at the Site will be prepared subsequent to the completion of the remedial design in order to address the risks associated with the planned work tasks. The HASP will be prepared in accordance with all applicable federal, state and local requirements including, but not limited to, Occupational Safety and Health Administration Regulations 29 CFR Part 1910 (Occupational Safety and Health Standards) and 29 CFR Part 1926 (Safety and Health Regulations for Construction) and N.J.A.C.7:26E-1.9. The HASP will outline the health and safety procedures and equipment required for activities to minimize the potential for exposure to Site workers, including construction workers. The HASP will be submitted to NJDEP after retention of the Remediation Contractor and prior to implementation of the RA at the Site.

4.8 QUALITY ASSURANCE PROJECT PLAN

A Site-specific Quality Assurance Project Plan (QAPP) has been prepared to address sampling and analytical testing to be conducted in conjunction with remediation activities at the Site (Appendix K). The QAPP was prepared in accordance with the requirements of N.J.A.C. 7:26E-2.2. The QAPP outlines the procedures required to obtain reliable, defensible data.

SECTION 5.0
INSTITUTIONAL CONTROLS

5.1 DEED NOTICES

Both on-site and off-site soil exceeding NJDEP RDC Criteria will remain after implementation of the remedy. Pursuant to N.J.A.C. 7:26E-8.1(b)1 and 8.2, deed notices for those areas with soil exceeding the applicable soil cleanup criteria will be prepared. The deed notices will be recorded in accordance with N.J.A.C. 7:26E-8.2.

5.1.1 On-Site Deed Notice

Hatco will execute the model NJDEP Deed Notice for its property, which is included in Appendix L.

5.1.2 Off-Site Deed Notices

Implementation of the remedy will require Deed Notices for two properties immediately west of the southwest corner of the Site. These are referred to as the "Crown Pacific" property and the "Industrial Avenue" property. Weston is currently negotiating to allow implementation of the capping remedy on these properties.

5.2 CLASSIFICATION EXCEPTION AREA

The groundwater analytical data from the RI performed by URS was used to determine the horizontal and vertical extent of groundwater contamination associated with the Site. This determination was based on a comparison of the groundwater analytical data to NJDEP GQS and the Interim Specific Criteria presented in NJDEP's memorandum of February 5, 1997 entitled "Changes to the Safe Drinking Water Act and the Effect of the Groundwater Quality Standards." The aquifers impacted by the presence of compounds at concentrations above these criteria are classified as Class IIA aquifers. Therefore, pursuant to N.J.A.C. 7:9-6 and N.J.A.C. 7:26E-8.3, a Classification Exception Area (CEA) to address the affected area will be proposed based on then current NJDEP GQS and Interim Specific Criteria. The CEA proposal will also include a Well Restriction Area (WRA). The CEA proposal will be submitted to NJDEP following further evaluation of LNAPL removal so that a reasonable estimate for the duration of the CEA may be developed.

SECTION 6.0
REPORTING

6.1 PROGRESS REPORTS

Periodic progress reports will be prepared in accordance with N.J.A.C. 7:26E-6.5 and 6.6. Progress reports will be prepared annually unless otherwise specified by NJDEP. Progress reports will identify:

- All remedial actions accomplished during the reporting period;
- Identification of any proposed deviations from and/or modifications to the approved RAWP;
- Problems or delays in the implementation of the RAWP and proposed corrections, including schedule adjustments and the status of permit applications;
- Remedial activities planned for the next reporting period;
- Actual costs of remediation incurred to date (to be provided annually);
- Additional information required for oversight, if applicable, including tabulation of sample results, waste classification data, and a listing of all types and quantities of waste generated by the RA; and
- Additional documentation (e.g., photographs), as appropriate.

6.2 REMEDIAL ACTION REPORT

The Remedial Action Report (RAR) will be prepared following completion of the remediation activities described in this RAWP. The RAR will be prepared in accordance with N.J.A.C. 7:26E-6.7, will present the results of the RA, and will include the following information:

- A summary of the remedial investigation;
- A summary of the remedial activities, including documentation of any field changes or other deviations from the approved RAWP;
- A list of the remediation standards applied to the RA;
- Tables and figures containing all pre- and post-remedial data required to document completion of the RA, including:
- Analytical data, and
- LNAPL recovery data;
- "As-built" diagrams for any permanent structures including caps and any other remedial structures which will remain in place after completion of the RA;
- A detailed description of Site restoration activities pursuant to N.J.A.C. 7:26E-6.4, including:
- Well Abandonment Reports for each monitoring well that is sealed, and
- A detailed description of the source and quality of fill, if any fill is brought to the Site;
- Copies of the executed Deed Notices recorded with the county clerk in accordance with N.J.A.C. 7:26E-8.2, including an electronic copy;
- Documentation of CEA and WRA implementation;

- A detailed report of actual costs incurred;
- Fully executed manifests documenting any off-site transport of waste material; and
- A plan for maintenance and monitoring of engineering and institutional controls pursuant to N.J.A.C. 7:26E-8.4 through 8.7.

6.3 PERIODIC MAINTENANCE AND INSPECTION REPORTS

Every two years, periodic reports will be prepared in accordance with N.J.A.C. 7:26E-8.4(c). These reports will document maintenance and inspection activities performed to assure that engineering and institutional controls are operating as designed.

SECTION 7.0
REMEDIAL ACTION COST ESTIMATE

Consistent with the self-guarantee application submitted to the NJDEP, the estimated cost of remediation is $13,200,000. A breakdown follows:

	Present Value
LNAPL AND SHALLOW GW CONSTRUCTION	2,118,536
LAGOONS	243,201
LAGOONS ADDITIONAL SCOPE	1,084,298
ON-SITE SOILS - AREAS A, B, C AND D	194,501
CHANNEL D	128,589
CAPPING	3,329,777
OPERATION, MAINTENANCE, AND MONITORING	3,329,346
PCB SOIL REMEDIATION	2,767,124
Present Value Project Total	**13,195,382**

SECTION 8.0
IMPLEMENTATION SCHEDULE

The implementation schedule is provided as Figure 8-1. The remediation and post-remediation dates will be determined based on the Pre-Design Investigation, Design, and Permitting stages of the project. The remediation schedule dates will be submitted within 90 days following completion of pre-design investigation, which is scheduled to be completed June 19, 2006. The schedule will be updated as appropriate and submitted to NJDEP for their review.

SECTION 9.0
REFERENCES

De Pastrovich, T.L., Y. Baradat, R. Barthel, A. Chiarelli, and D.R. Fussell. 1979. Protection of ground water from oil pollution, CONCAWE, The Hague, 61 pp.

Owens, James P., Peter J. Sugarman, Norman F. Sohl, Ronaly A. Parker, Hugh F. Houghton, Richard Q. Volkert, Avery A. Drake, Jr., Randall C. Orndorff. 1995 Geologic Map of New Jersey: Central Sheet, US Department of the Interior USGS Open-File Report 95-253

Barksdale, Henry C., Meredith E. Johnson, Roger C. Baker, Edward J Schaefer, George D. DeBuchananne. 1943. Special Report 8 -The Ground-Water supplies of Middlesex County New Jersey. State of New Jersey State Water Policy Commission.

Parker, Ronald A. 1993. Stratigraphic Relations of the Sedimentary Rocks Below the Lower Jurassic Orange Mountain Basalt, Northern Newark Basin, New Jersey and New York. USGS Map MF-2208.

Table 2-1
Summary of Areas of Environmental Concern (AEC)
Hatco Corporation Site
Fords, New Jersey

AEC	DESCRIPTION
1	Closed Former Lagoons
2	Former Ponds Area
3	Railroad Siding Area
4	Ester I Building and Acid Tank Farm
5	Ester II Building, Tank Farm and area to the east and south
6	Phthalic Anhydride Process Area
7A	Phthalic Anhydride Residue Area
8	Tarry Area
9A	Ester I Tank Farm
9B	Alcohol Tank Farm
9C	Naphthalene Tank Farm
9D	Scales Tank Area
9E	No. 6 Fuel Oil Tank
10A	Current Drum and Waste Storage Area
10B	Former Drum and Waste Storage Area (north of Warehouse No. 5)
10C	Former Drum and Waste Storage Area (west of Warehouse No. 4)
11A	UST Area (Maintenance Building)
11B	Salt UST Area
12	Transformers
13	Southeast fill Area
14	Naphthalene Area
15	Site-wide Groundwater
16	Research and Development Laboratory
17	Clean fill area
18A	Pilot Plant I
18B	Pilot Plant II
19	ZAA Process area
20	Area East of Sling Tail Creek
21A	Crows Mill Tributary
21B	Sling Tail Creek
22	Sewer System

Table 3-1
Summary of Soil Criteria Exceedances
for Contaminants of Concern
(all soil samples)

COMPOUND	Number of Soil Samples	Range of Detected Concentrations (mg/kg)	Number of Samples above NJDEP Residential Direct Contact Criteria (RDC)	Percent of Samples above RDC	Number of Samples above NJDEP Non-Residential Direct Contact Criteria (NRDC)	Percent of Samples above NRDC	Number of Samples above NJDEP Impact to Groundwater Criteria (IGW)	Percent of Samples above IGW	RDC (mg/kg)	NRDC (mg/kg)	IGW (mg/kg)
Volatiles											
Benzene	390	0.0006 - 53	17	**4.4%**	11	**2.8%**	31	**7.9%**	3	13	1
Chlorobenzene	332	0.0014 - 7.8	0	**0.0%**	0	**0.0%**	1	**0.3%**	37	680	1
Chloroform	332	0.002 - 2.7	0	**0.0%**	0	**0.0%**	2	**0.6%**	19	28	1
1,1-dichloroethane	332	0.0023 - 320	0	**0.0%**	0	**0.0%**	5	**1.5%**	570	1000	10
1,1-dichloroethene	332	0.001 - 8.1	1	**0.3%**	0	**0.0%**	0	**0.0%**	8	150	10
Tetrachloroethene	335	0.003 - 3.3	0	**0.0%**	0	**0.0%**	2	**0.6%**	4	6	1
Toluene	387	0.001 - 2,600	1	**0.3%**	1	**0.3%**	3	**0.8%**	1,000	1,000	500
1,1,1-trichloroethane	332	0.001 - 3600	3	**0.9%**	1	**0.3%**	5	**1.5%**	210	1,000	50
1,1,2-trichloroethane	332	73	1	**0.3%**	0	**0.0%**	1	**0.3%**	22	420	1
Trichloroethene	335	0.004 - 42	2	**0.6%**	0	**0.0%**	9	**2.7%**	23	54	1
Xylenes (total)	391	0.0013 - 610	2	**0.5%**	0	**0.0%**	9	**2.3%**	410	1,000	67
Base/Neutrals											
Acenaphthene	848	0.006 - 140	0	**0.0%**	0	**0.0%**	2	**0.2%**	3,400	10,000	100
Anthracene	855	0.008 - 200	0	**0.0%**	0	**0.0%**	1	**0.1%**	10,000	10,000	100
Benzo(a)anthracene	855	0.003 - 180	22	**2.6%**	9	**1.1%**	0	**0.0%**	0.9	4	500
Benzo(a)pyrene	855	0.0091 - 130	22	**2.6%**	22	**2.6%**	1	**0.1%**	0.66	0.66	100
Benzo(b)fluoranthene	855	0.01 - 180	19	**2.2%**	5	**0.6%**	2	**0.2%**	0.9	4	50
Benzo(k)fluoranthene	849	0.005 - 160	9	**1.1%**	3	**0.4%**	0	**0.0%**	0.9	4	500
Bis(2-ethylhexyl)phthalate	985	0.025 - 130,000	285	**28.9%**	186	**18.9%**	236	**24.0%**	49	210	100
Butylbenzylphthalate	978	0.007 - 31,000	29	**3.0%**	9	**0.9%**	90	**9.2%**	1,100	10,000	100
Chrysene	855	0.007 - 210	7	**0.8%**	2	**0.2%**	0	**0.0%**	9	40	500
Diethyl phthalate	974	0.009 - 13,000	1	**0.1%**	1	**0.1%**	42	**4.3%**	10,000	10,000	50
Dimethylphthalate	855	0.042 - 8,500	0	**0.0%**	0	**0.0%**	6	**0.7%**	10,000	10,000	50
Di-n-butyl phthalate	977	0.0072 - 17,000	10	**1.0%**	2	**0.2%**	95	**9.7%**	5,700	10,000	100
Di-n-octyl phthalate	978	0.002 - 13,000	12	**1.2%**	1	**0.1%**	62	**6.3%**	1,100	10,000	100
Fluoranthene	855	0.006 - 850	0	**0.0%**	0	**0.0%**	3	**0.4%**	2,300	10,000	100
Fluorene	855	0.016 - 310	0	**0.0%**	0	**0.0%**	2	**0.2%**	2,300	10,000	100
Indeno(1,2,3-cd)pyrene	848	0.0099 - 10	6	**0.7%**	2	**0.2%**	0	**0.0%**	0.9	4	500
Naphthalene	856	0.008 - 52,000	31	**3.6%**	7	**0.8%**	38	**4.4%**	230	4,200	100
Pyrene	855	0.007 - 420	0	**0.0%**	0	**0.0%**	2	**0.2%**	1,700	10,000	100
Total Petroleum Hydrocarbons	168	5.9 - 160,000	15	**8.9%**	15	**8.9%**	-		10,000	10,000	
PCBs											
Aroclor-1248	1305	0.0033 - 12,000	643	**49.3%**	513	**39.3%**	133	**10.2%**	0.49*	2*	100**
Aroclor-1254	1296	0.0071 - 1,800	166	**12.8%**	98	**7.6%**	7	**0.5%**	0.49*	2*	100**
Aroclor-1260	1271	0.041 - 1.5	1	**0.1%**	0	**0.0%**	0	**0.0%**	0.49*	2*	100**
Metals											
Antimony	179	0.11 - 52.8	3	**1.7%**	0	**0.0%**	-		14	340	
Arsenic	180	0.12 - 155	5	**2.8%**	5	**2.8%**	-		20	20	
Barium	108	1.4 - 1,960	1	**0.9%**	0	**0.0%**	-		700	47,000	
Beryllium	179	0.0567 - 3.1	3	**1.7%**	3	**1.7%**	-		2	2	
Chromium	180	2.24 - 639	3	**1.7%**	0	**0.0%**	-		240	6100	
Copper	180	0.893 - 1,190	3	**1.7%**	3	**1.7%**	-		600	600	
Lead	195	0.665 - 1,660	8	**4.1%**	3	**1.5%**	-		400	600	
Thallium	179	0.14 - 4.42	1	**0.6%**	1	**0.6%**	-		2	2	
Zinc	180	2.5 - 2,780	1	**0.6%**	1	**0.6%**	-		1,500	1,500	

Note:
* Criteria are for total PCBs
** Criteria based on NJDEP PCB remediation policy stated in Site Remediation News, December 1998.
Compounds/percentages highlighted in blue where more than 5% of the samples exceed one or more criteria.
Only those compounds for which NJDEP criteria exist are listed.
Only those compounds detected in concentrations above one or more NJDEP criteria are listed.

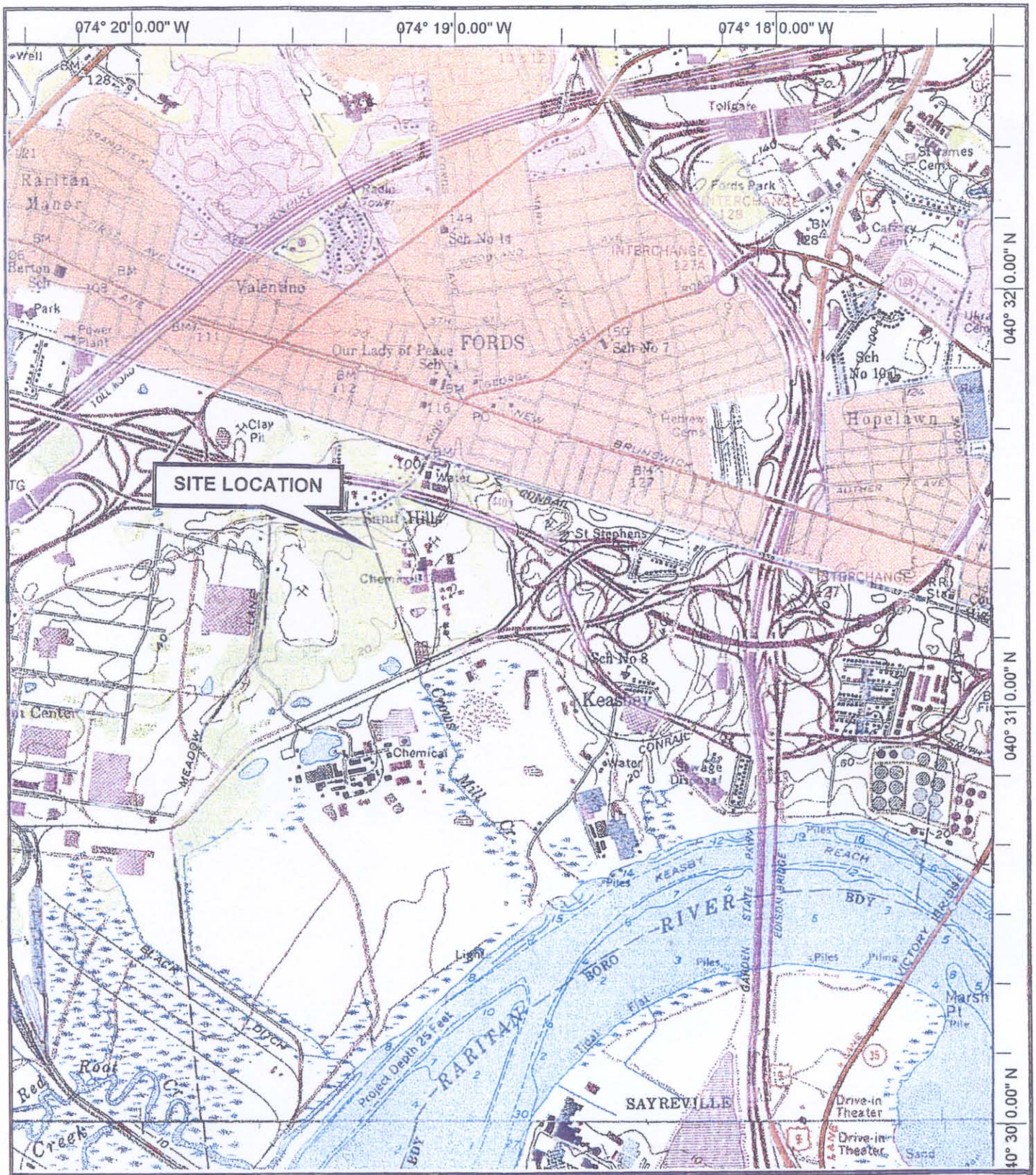
Table 4-1
Summary of Detected Organic Compounds and Physical Properties of LNAPL Samples

Sample	Date	Benzene (ppm)	1,2-DCE (ppm)	Ethylbenzene (ppm)	2-hexanone (ppm)	PCE (ppm)	Toluene (ppm)	TCE (ppm)	Total xylenes (ppm)
PROD 15s	05/14/1992	ND	ND	ND	ND	ND	ND	ND	57000
PROD 15s	10/21/1992	1400	ND	ND	ND	ND	930	300 J	20000
PROD 15s	05/26/1994	800	ND	37	210	ND	1200	320	3600
PROD 26s	09/20/1994	1100	ND	ND	ND	ND	1700	ND	170
PROD 28s	04/25/1994	920	68	19 J	ND	34	1700	280	140
PROD 28s	05/26/1994	940	83	28 J	ND	35 J	1700	300	160
PROD 30s	04/08/1994	170	79	14 J	ND	ND	3000	79	57
PROD 30s	05/27/1994	180	ND	ND	ND	ND	2900	100	39 J
PROD 30s	04/06/1994	1400	ND	42	ND	ND	1800	ND	320
PROD 31 s	05/27/1994	710	ND	24 J	ND	ND	1600	ND	180
PROD 32s(A)	04/25/1994	1500	ND	38 J	ND	ND	1800	ND	290
PROD 32s(B)	04/25/1994	1500	ND	32 J	ND	ND	1900	ND	300
PROD 32s(A)	05/27/1994	1400	ND	29 J	ND	ND	1800	ND	280
PROD 32s(B)	05/27/1994	1400	ND	36 J	ND	ND	1800	ND	280

Sample	Date	BEHP (ppm)	butylbenzyl-phthalate (ppm)	diethyl-phthalate (ppm)	di-n-butyl-phthalate (ppm)	di-n-octyl-phthalate (ppm)	TPH (ppm)	Aroclor 1248 (ppm)	Viscosity (centistokes)	Specific Gravity (@22 C)
PROD 15s	05/14/1992	430 J	110 J	ND	200 J	ND	NA	2800	NA	NA
PROD 15s	10/21/1992	20000	9000	2800	12000	1800	NA	13000	NA	NA
PROD 15s	05/26/1994	7200	11000	3000	14000	2700	NA	7900	13.2	0.91
PROD 15s	11/17/1994	NA	NA	NA	NA	NA	54000		NA	NA
PROD 25s	12/10/1993	1100	530	140	430	130	NA	15000	NA	NA
PROD 26s	09/20/1994	51000	18000	4200	23000	5800	NA	1200	13.62	0.92
PROD 28s	04/25/1994	32000	15000	ND	14000	2900	NA	7200	NA	NA
PROD 28s	05/27/1994	33000	16000	3200	14000	3700	NA	6000	11.8	0.9
PROD 30s	04/08/1994	72000	8800	14000	17000	5800	NA	1300	NA	NA
PROD 30s	05/27/1994	92000	11000	17000	13000	6300	NA	1500	13.3	0.91
PROD 31s	04/06/1994	42000	16000	4100 J	22000	3100 J	NA	1200	11.6	0.91
PROD 31 s	05/27/1994	44000	18000	2900	17000	4300	NA	1400	12.6	0.92
PROD 31 s	09/20/1994	NA	NA	NA	NA	NA	NA	90000	NA	NA
PROD 31 s	11/16/1994	NA	NA	NA	NA	NA	79,900	NA	NA	NA
PROD 32s(A)	04/25/1994	41000	18000	5500	24000	4100	NA	1700	12.04	0.91
PROD 32s(B)	04/25/1994	39000	16000	ND	23000	3700	NA	1600	11.72	0.91
PROD 32s(A)	05/27/1994	40000	17000	5800	24000	3800	NA	1500	11.2	0.92
PROD 32s(B)	05/27/1994	26000	12000	3700	16000	2800	NA	1800	11.4	0.91
PTW-1	05/13/1999	61000	22000	3500	24000	14000	NA	5500	16.1	0.927
PTW-14/15	05/13/1999	48000	23000	13000	22000	12000	NA	2100	19.3	0.93
PTW-23	05/13/1999	45000	62000	3400	20000	8200	NA	7000	19.3	0.945

Note:

J = Estimated concentration
ND = Not detected.
NA = Not analyzed.
1,2-DCE = 1,2-dichloroethene
PCE = tetrachloroethylene
TCE = trichloroethylene
BEHP = bis(2-ethylhexyl)phthalate
TPH = total petroleum hydrocarbons



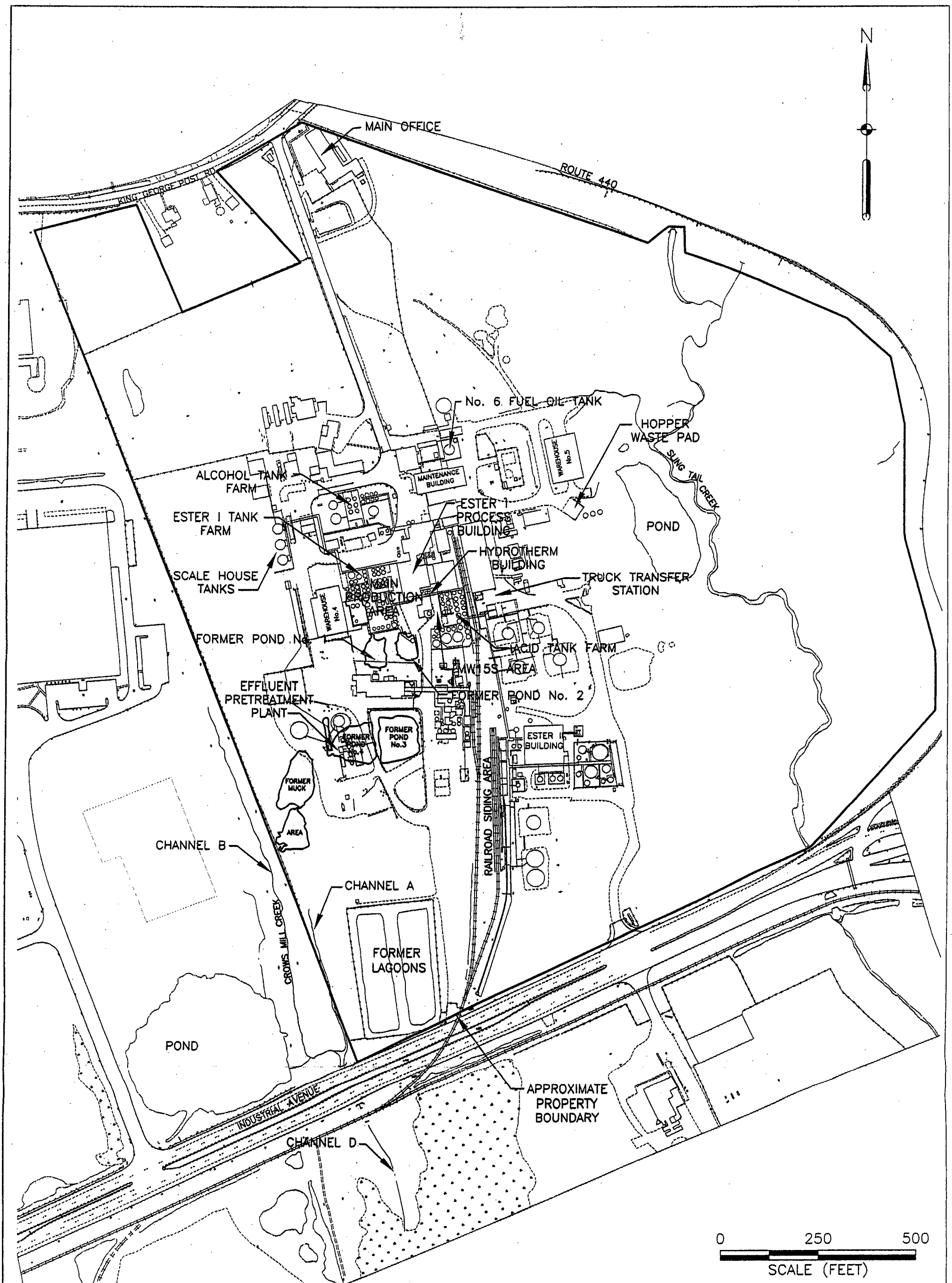
Base Map Source: Perth Amboy, NJ USGS topographic quadrangle 1956, photorevised 1981

North

SITE LOCATION MAP
Hatco Corporation Site
Fords, New Jersey

URS
Wayne, New Jersey

Dr. by: DJS	Scale: 1:24,000	Proj. No.: 47-06E04695.00
Chk'd by: MEC	Date: 11/14/2000	FIG. NO. 1-1

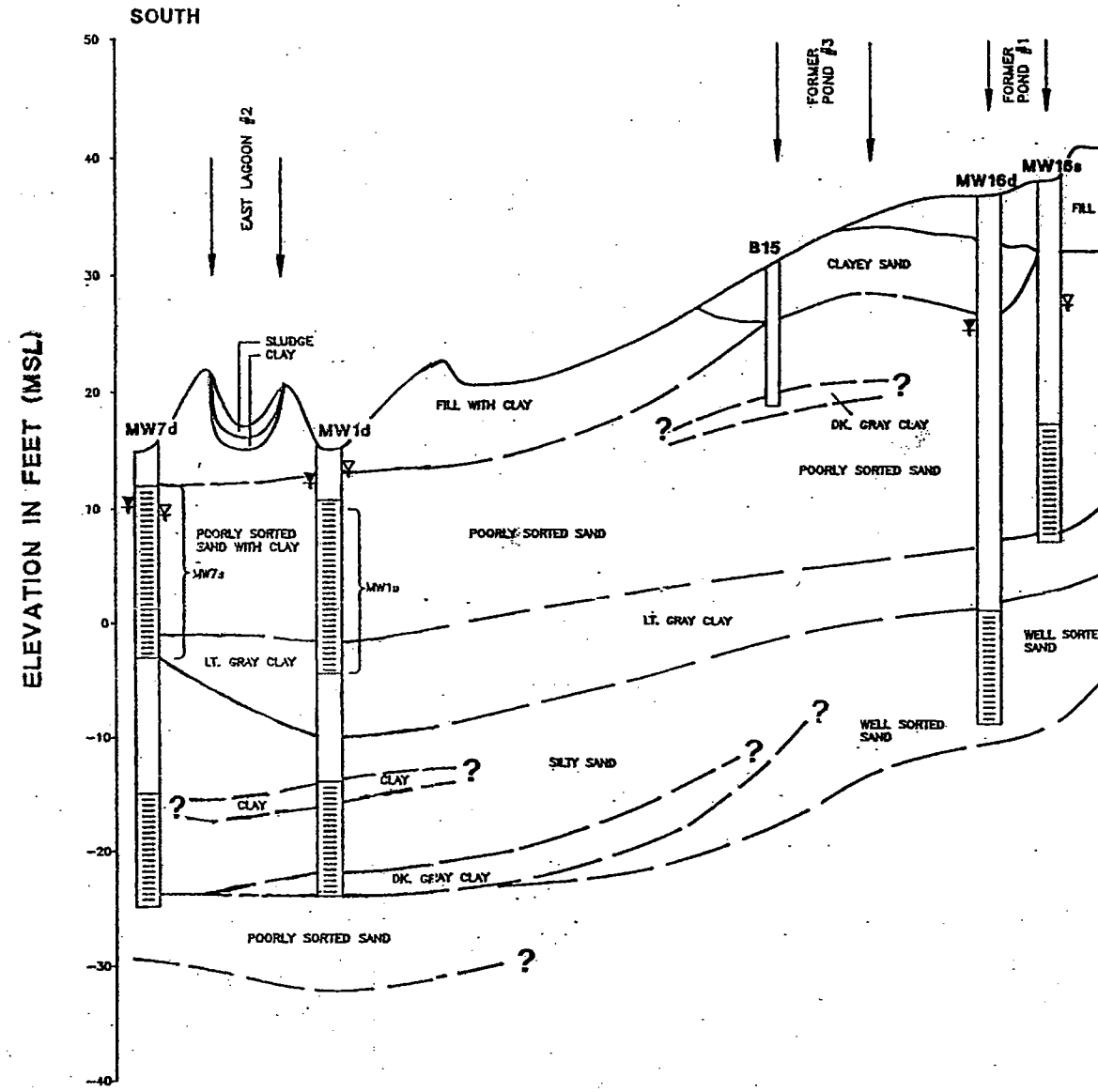


SITE FEATURES MAP
HATCO CORPORATION SITE
FORDS, NEW JERSEY

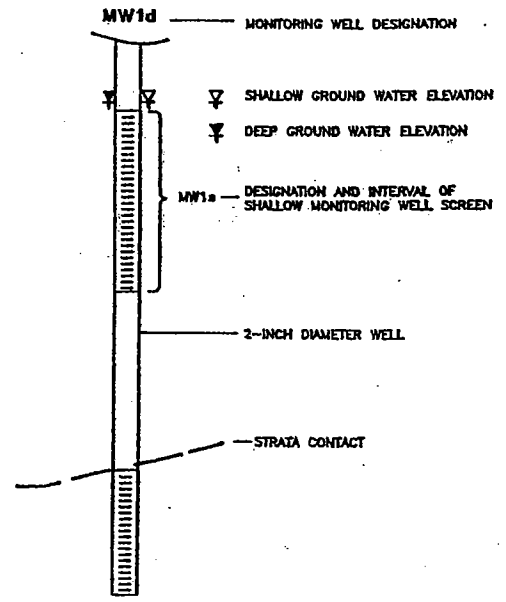
URS
WAYNE, NEW JERSEY

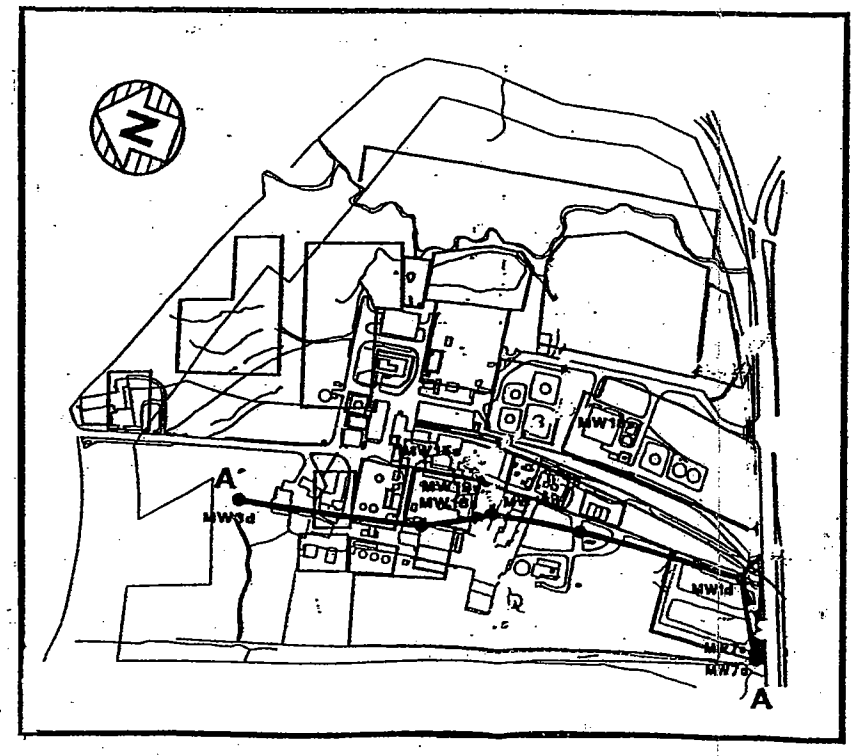
DR. BY	ET	SCALE	AS SHOWN	DWG. NO. 64695099	PROJ. NO. 6E04695
CK'D. BY	MC	DATE	FEB. 23, 2001	FIG. NO.	2-1

C:\ACAD\6E04695\64695099.dwg, 03/23/2001 03:56:10 PM, 1:1



EXPLANATION



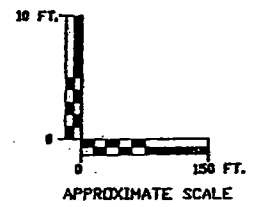


NOTES:

1) SURFACE PLOTTED FROM TOPOGRAPHIC SURVEY MAP PROJECT NO.: 92-805 BY GEOD CORP. PHOTOGRAMMETRIC SCIENCES SURVEY TECHNOLOGIES

2) GROUND WATER ELEVATION (FT., MSL) 10/18/92.

3) WELLS MW7s, MW7d, MW16s AND MW16d HAVE 4-INCH DIAMETERS



APPROXIMATE SCALE

SOURCE:

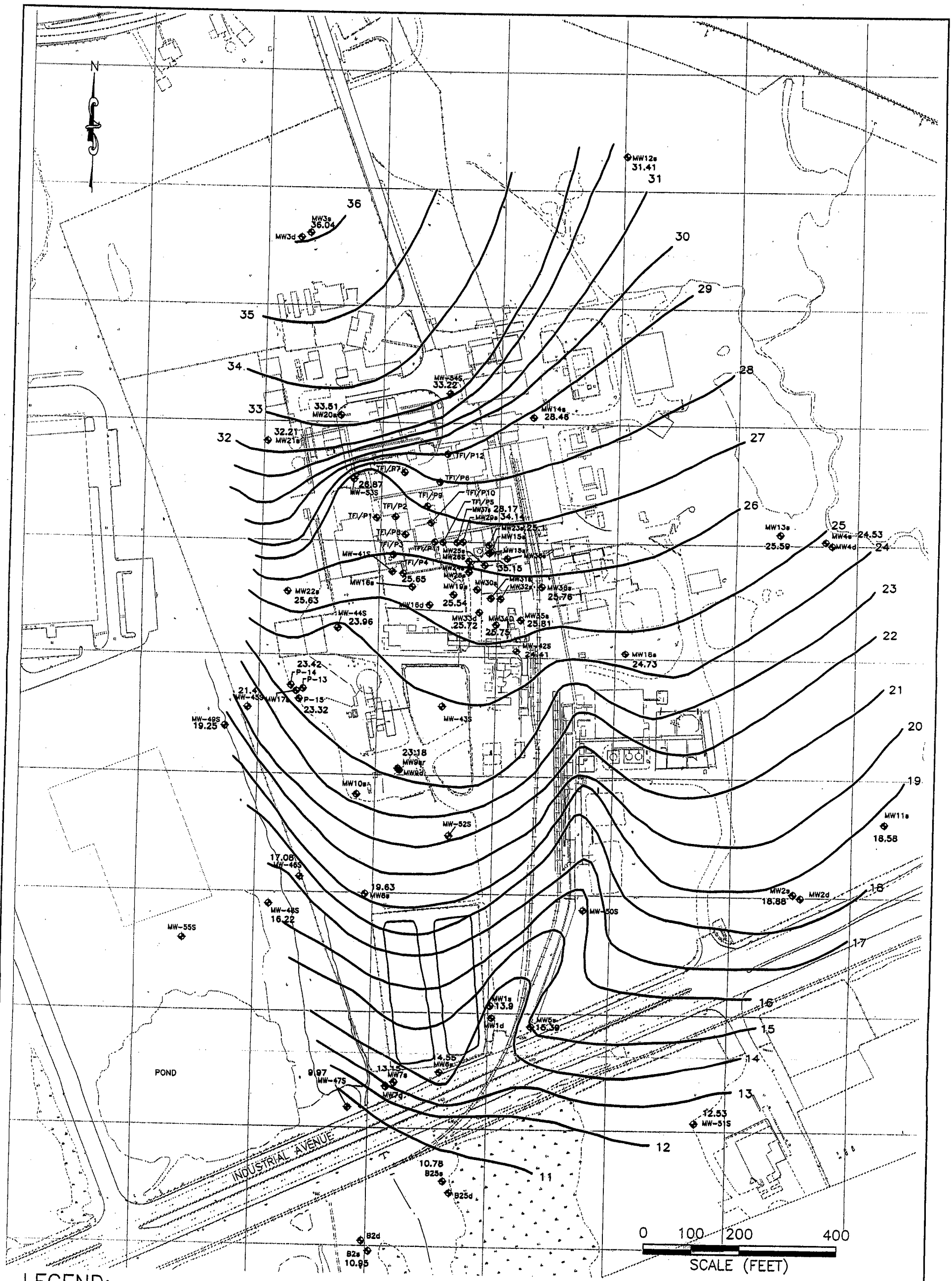
REMEDIAL INVESTIGATION REPORT, MAY 1993
BY DAN RAVIV ASSOCIATES, INC.

K:\CADD\6E04695\64695100.dwg, 01/05/2001 10:09:08 AM

STRATIGRAPHIC CROSS SECTION
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY	XXX	SCALE	AS SHOWN	DWG. NO. 64695100	PROJ. NO. 6E04695
CK'D. BY	MC	DATE	JAN. 5, 2001	FIG. NO.	2-2



LEGEND:

- MONITORING WELL LOCATION
- 11 — GROUNDWATER CONTOURS

NOTE:
GROUNDWATER ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL

GROUNDWATER CONTOURS
SHALLOW MONITORING WELLS OCT/NOV 1998
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY ET	SCALE AS SHOWN	DWG. NO. 64695098	PROJ. NO. 6E04695	
CK'D. BY MC	DATE FEB. 22, 2001	FIG. NO. 2-3		

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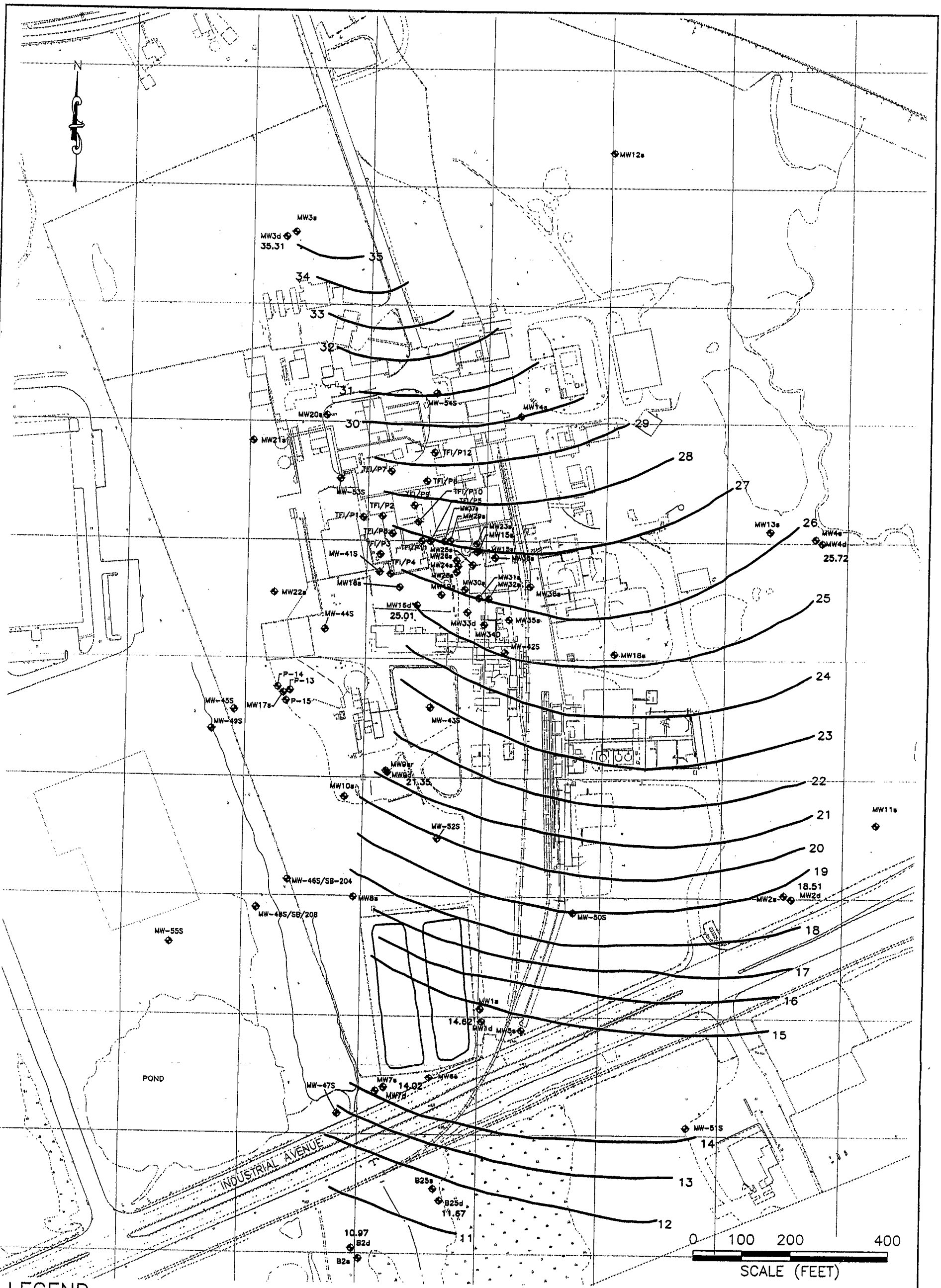


LEGEND:

- MONITORING WELL LOCATION
- 11 GROUNDWATER CONTOURS

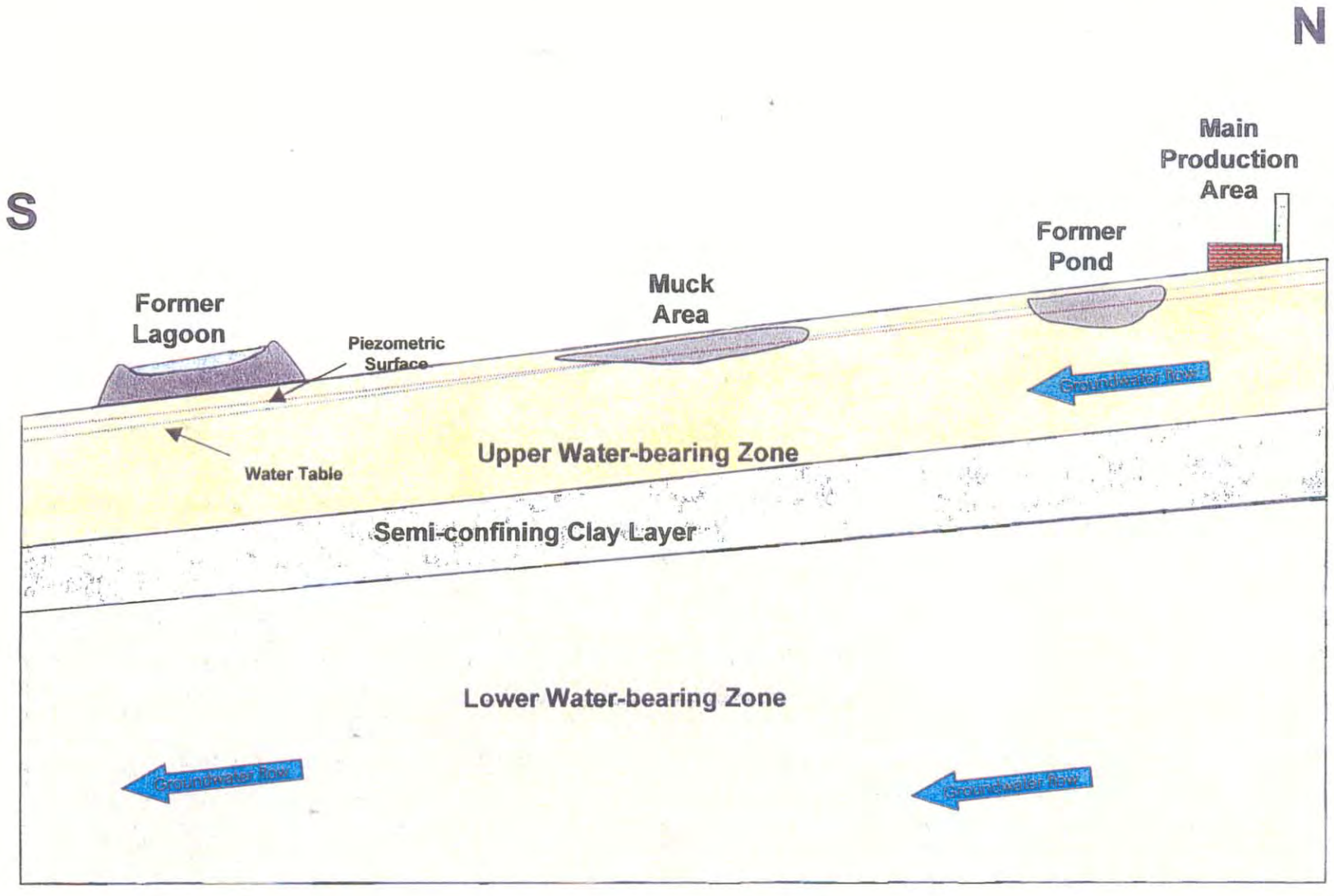
NOTE:
GROUNDWATER ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL

GROUNDWATER CONTOURS
DEEP MONITORING WELLS OCT/NOV 1998
HATCO CORPORATION SITE
- FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY	ET	SCALE	AS SHOWN	DWG. NO. 64695097	PROJ. NO. 6E04695
CK'D. BY	MC	DATE	FEB. 22, 2001	FIG. NO.	2-4

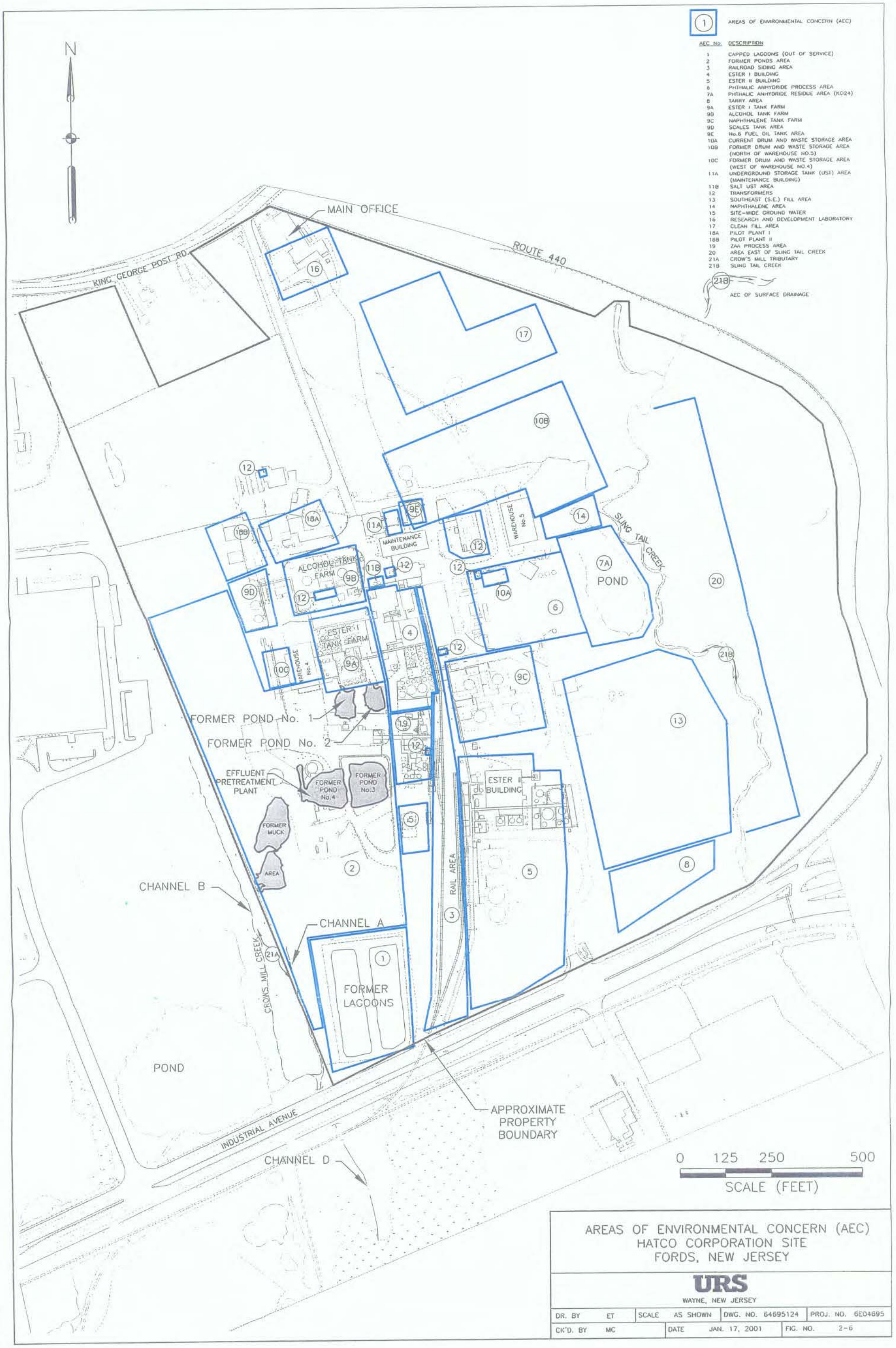
K:\C-ADG\6E04695\64695097.dwg, 03/23/2001 03:58:40 PM, 1:1



PHYSICAL CONCEPTUAL SITE MODEL
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY	MC	SCALE	N.T.S.	DWG. NO.	64695132	PROJ. NO.	6E04695
CK'D. BY	MC	DATE	JAN 23, 2001	FIG. NO.	2-5		



AREAS OF ENVIRONMENTAL CONCERN (AEC)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY ET	SCALE AS SHOWN	DWG. NO. 64695124	PROJ. NO. 6E04695	
CK'D. BY MC	DATE JAN. 17, 2001	FIG. NO. 2-6		

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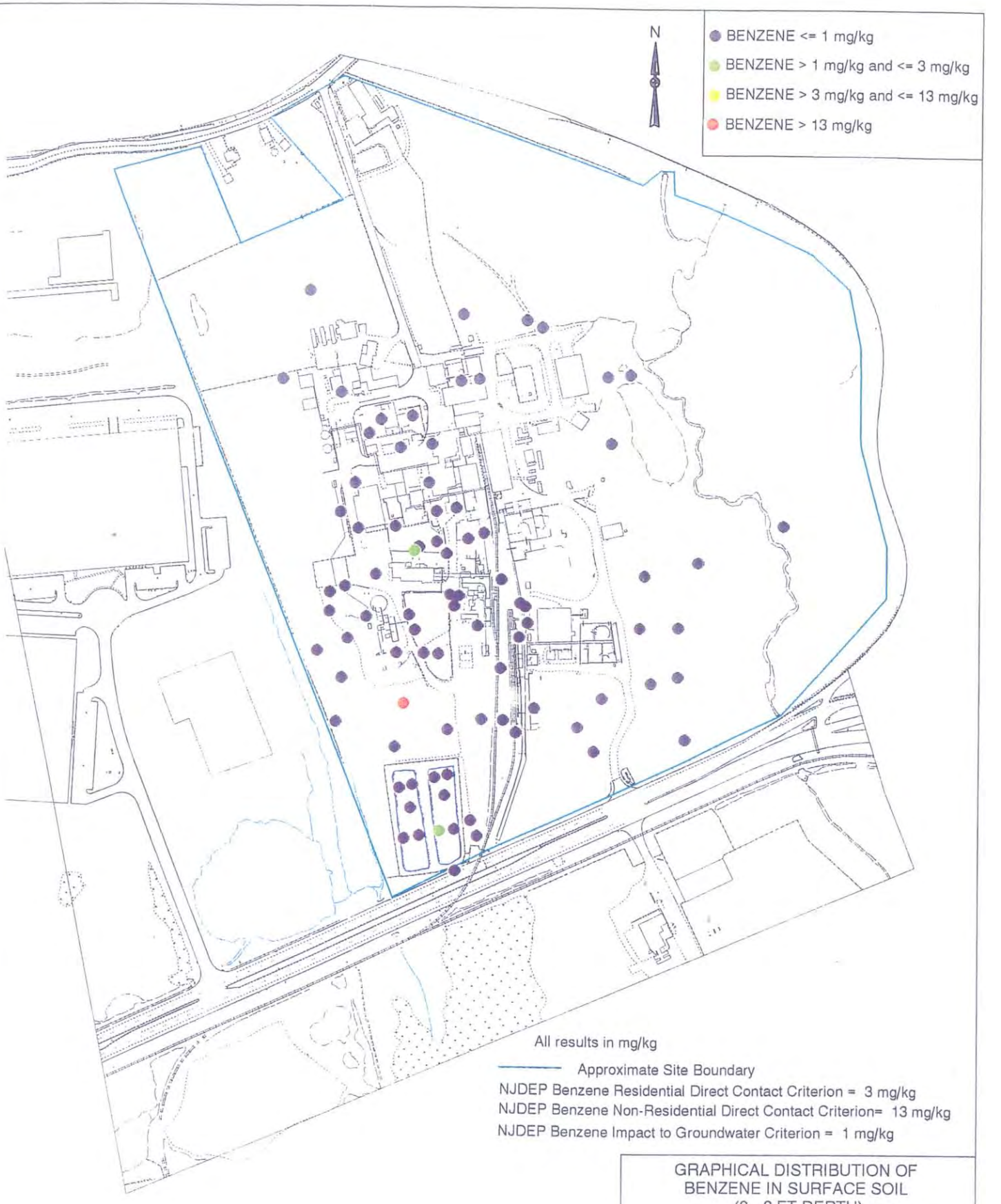
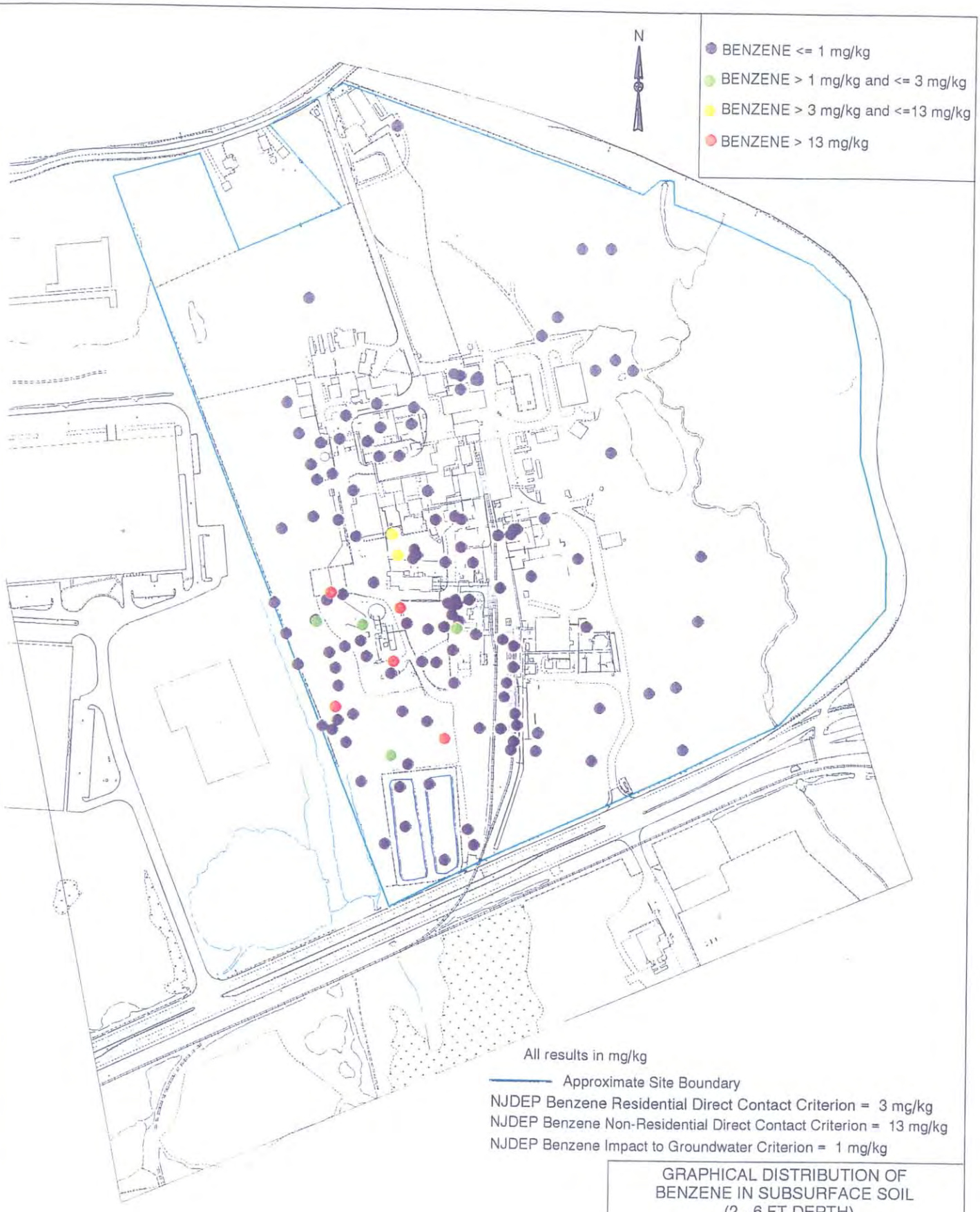


GRAPHICAL DISTRIBUTION OF
BENZENE IN SURFACE SOIL
(0 - 2 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

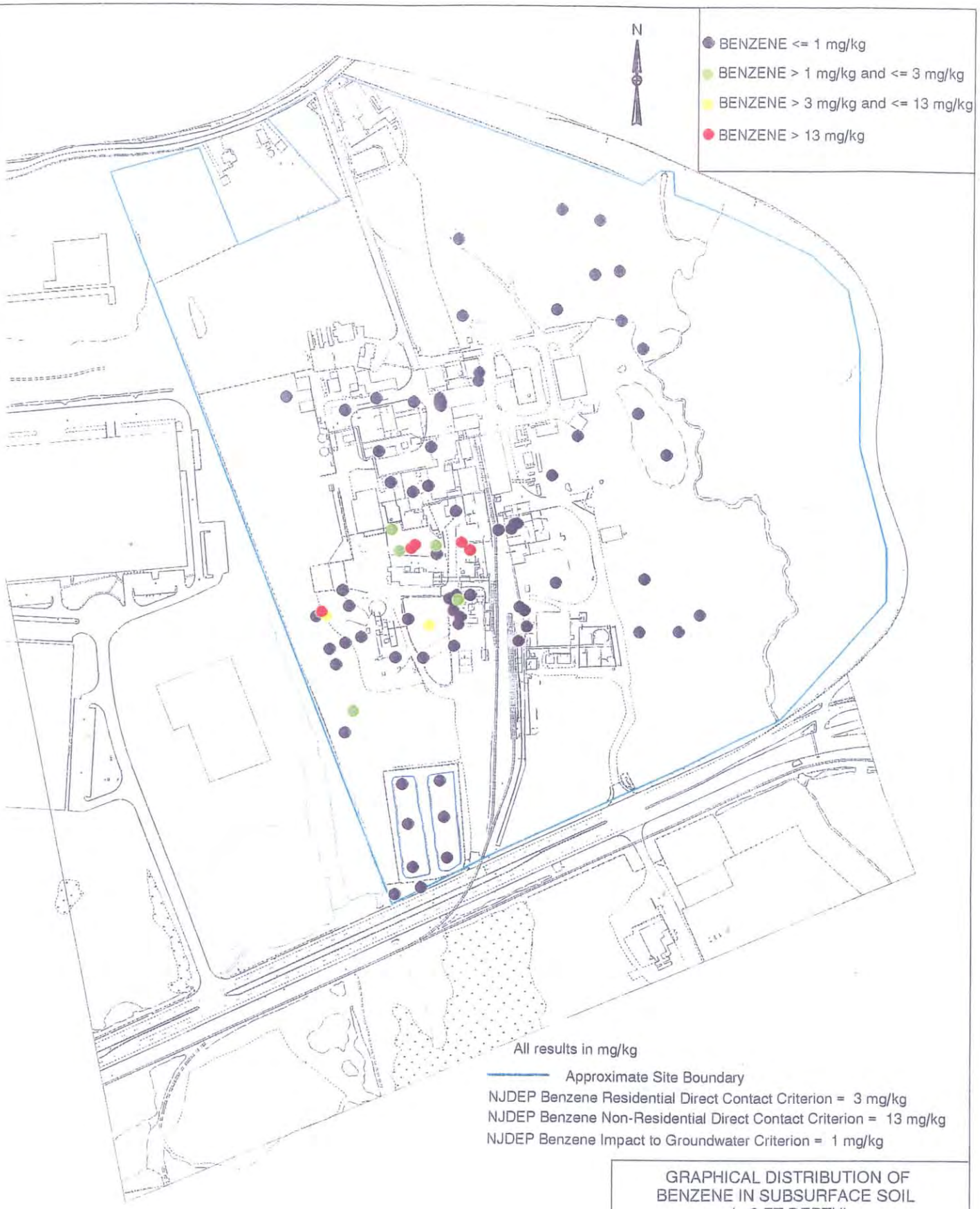
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-1



GRAPHICAL DISTRIBUTION OF
BENZENE IN SUBSURFACE SOIL
(2 - 6 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

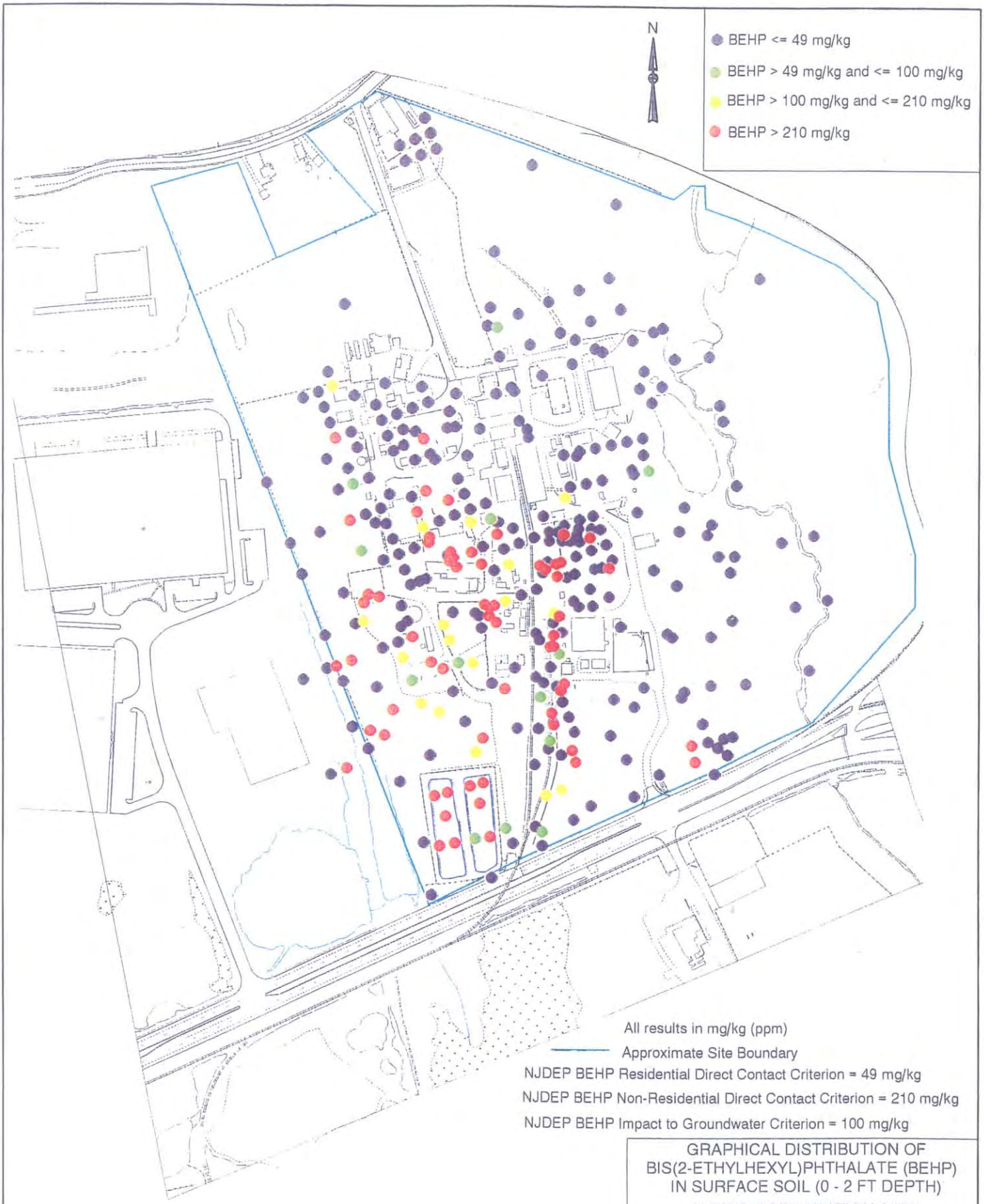
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-2



GRAPHICAL DISTRIBUTION OF
BENZENE IN SUBSURFACE SOIL
(> 6 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. 3-3	



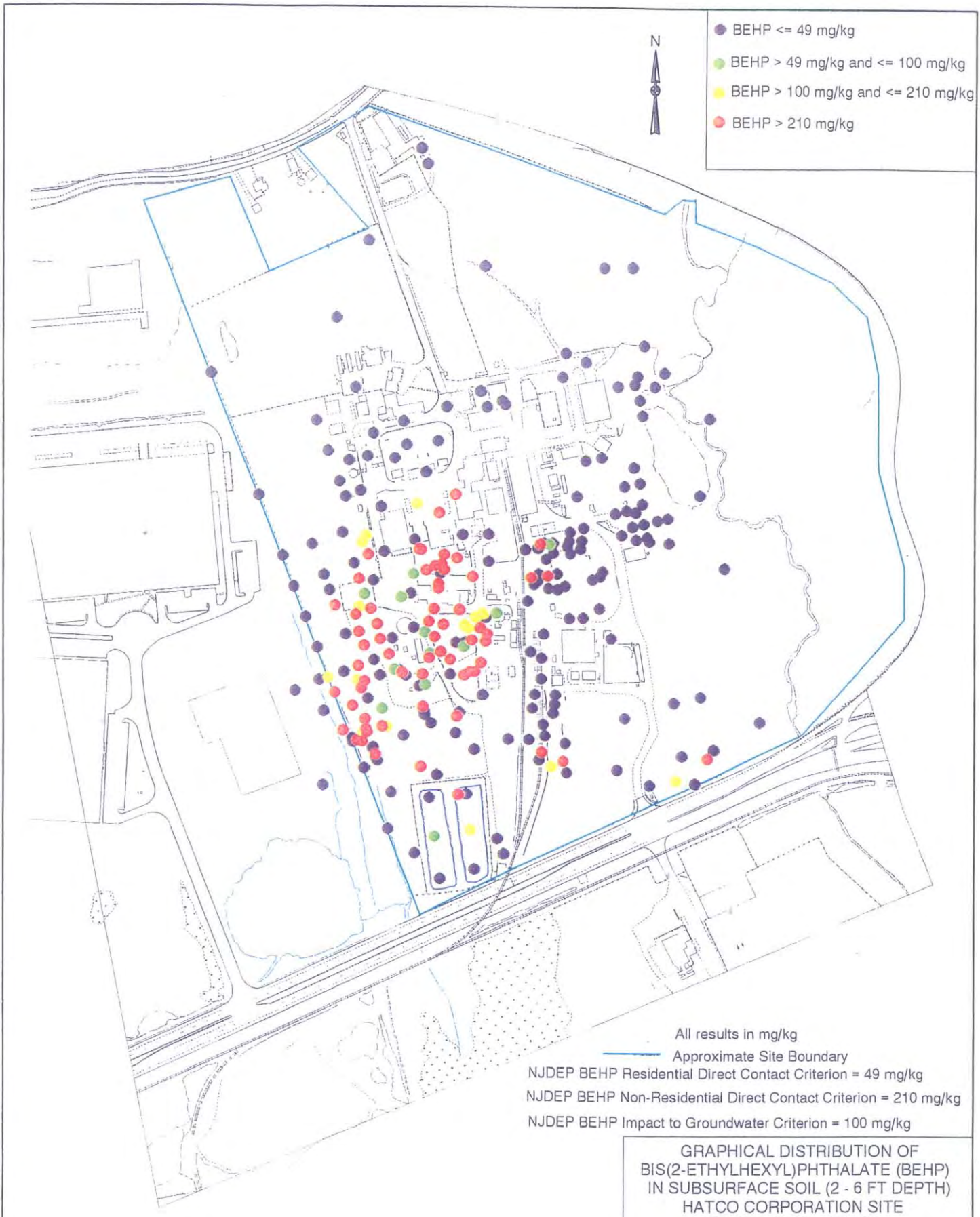
GRAPHICAL DISTRIBUTION OF
BIS(2-ETHYLHEXYL)PHTHALATE (BEHP)
IN SURFACE SOIL (0 - 2 FT DEPTH)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

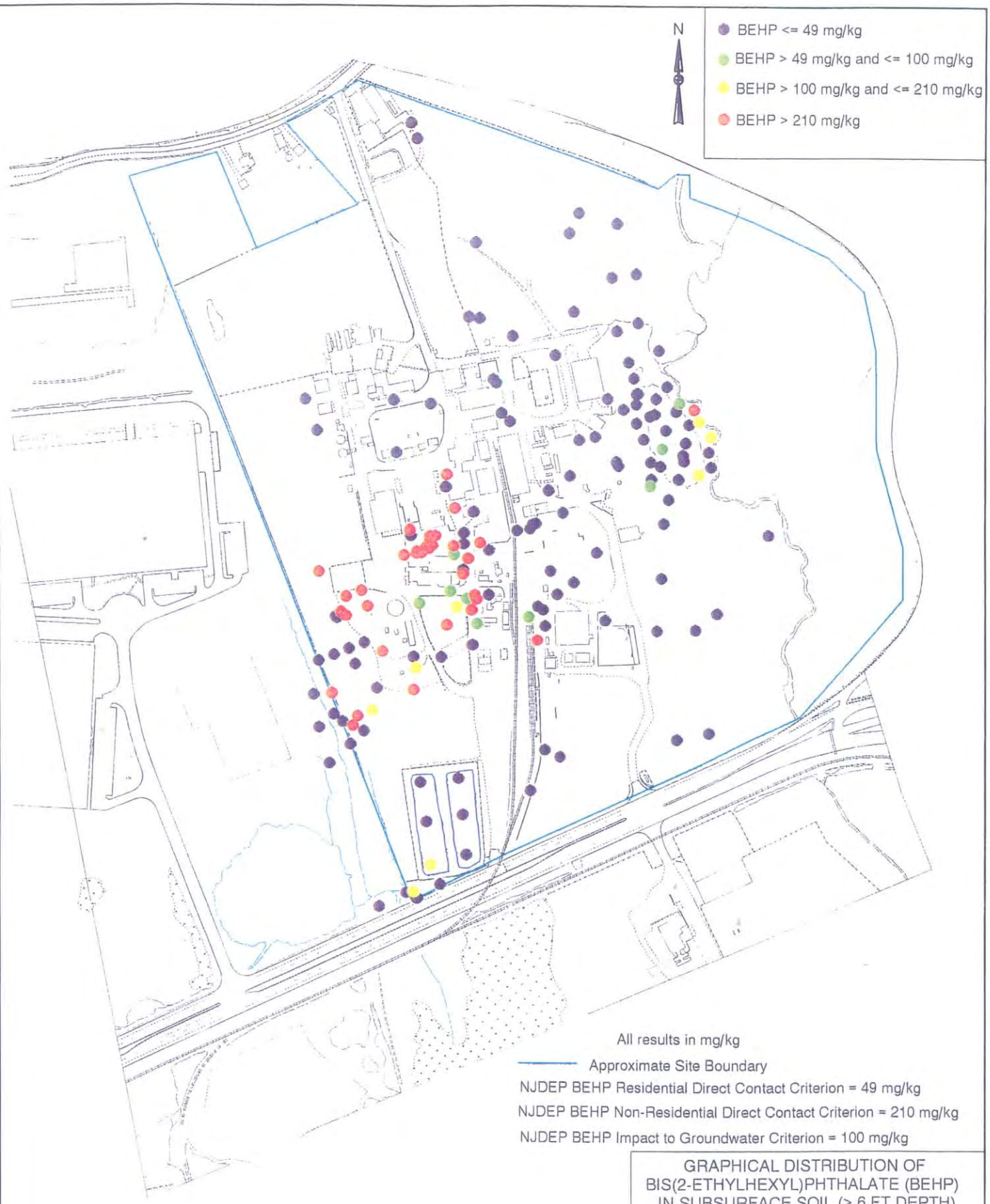
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-4



GRAPHICAL DISTRIBUTION OF
BIS(2-ETHYLHEXYL)PHTHALATE (BEHP)
IN SUBSURFACE SOIL (2 - 6 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

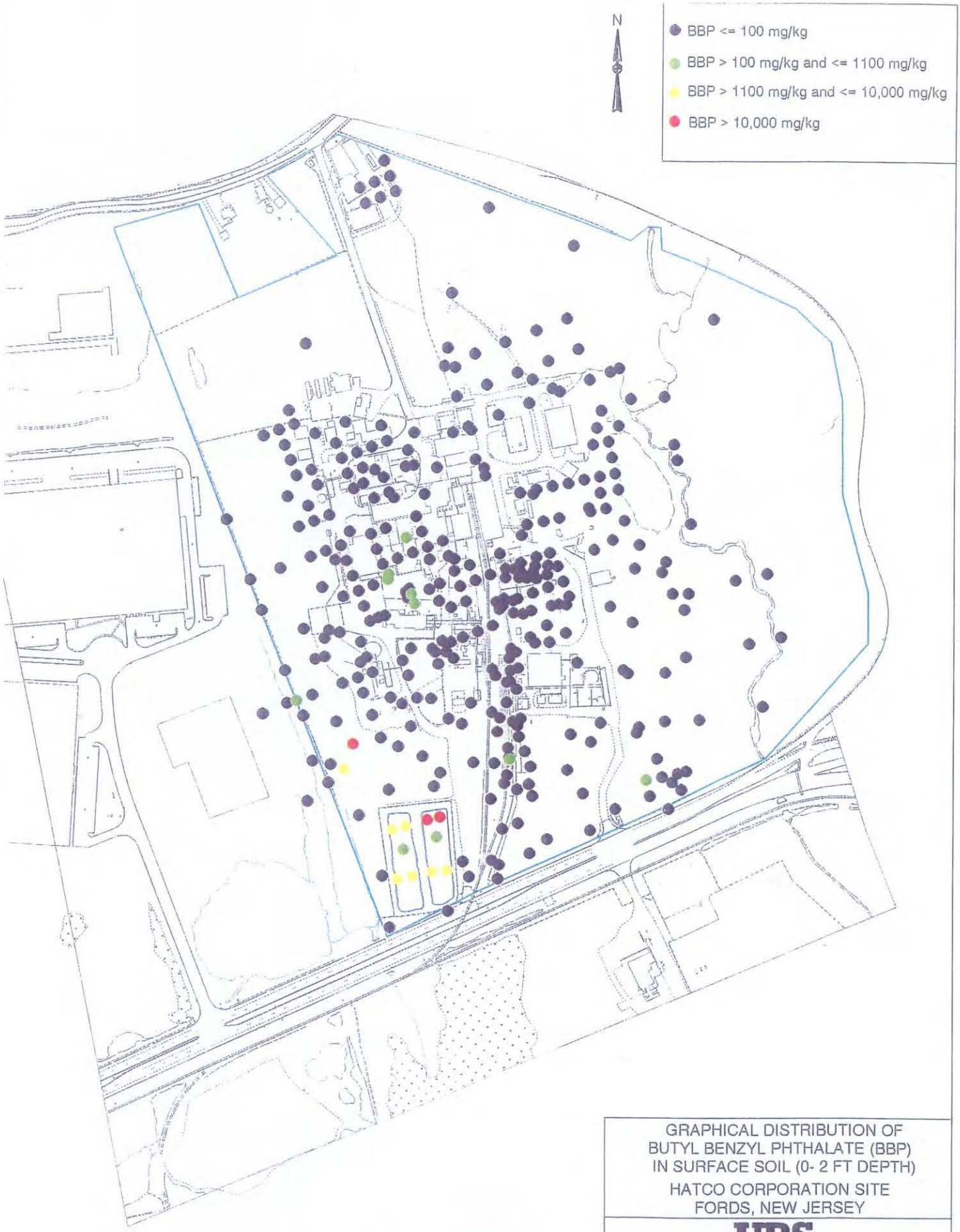
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-5



GRAPHICAL DISTRIBUTION OF
BIS(2-ETHYLHEXYL)PHTHALATE (BEHP)
IN SUBSURFACE SOIL (> 6 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

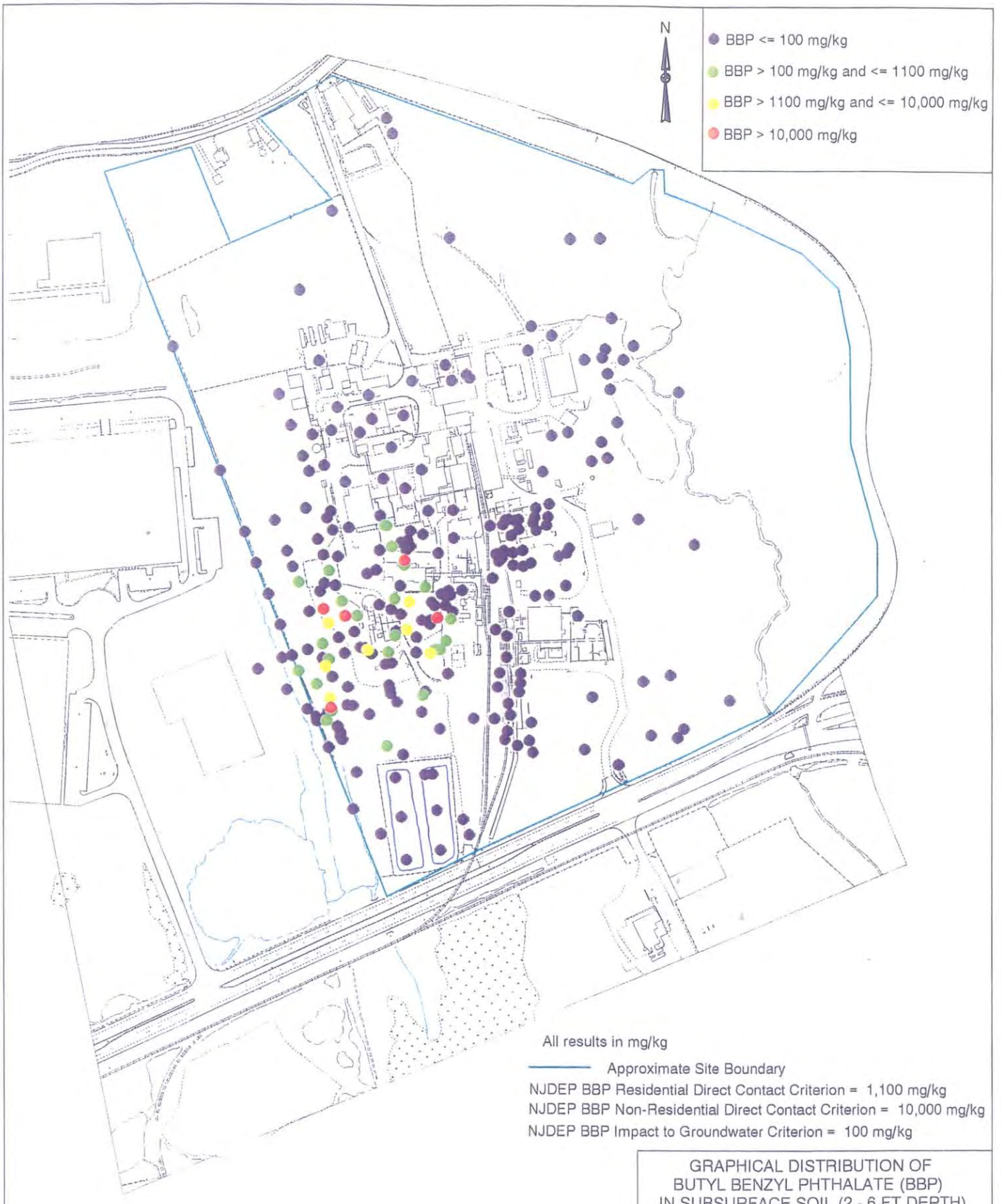
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY GRJ	DATE: MARCH 20, 2001		FIG. NO. 3-6



GRAPHICAL DISTRIBUTION OF
BUTYL BENZYL PHTHALATE (BBP)
IN SURFACE SOIL (0- 2 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

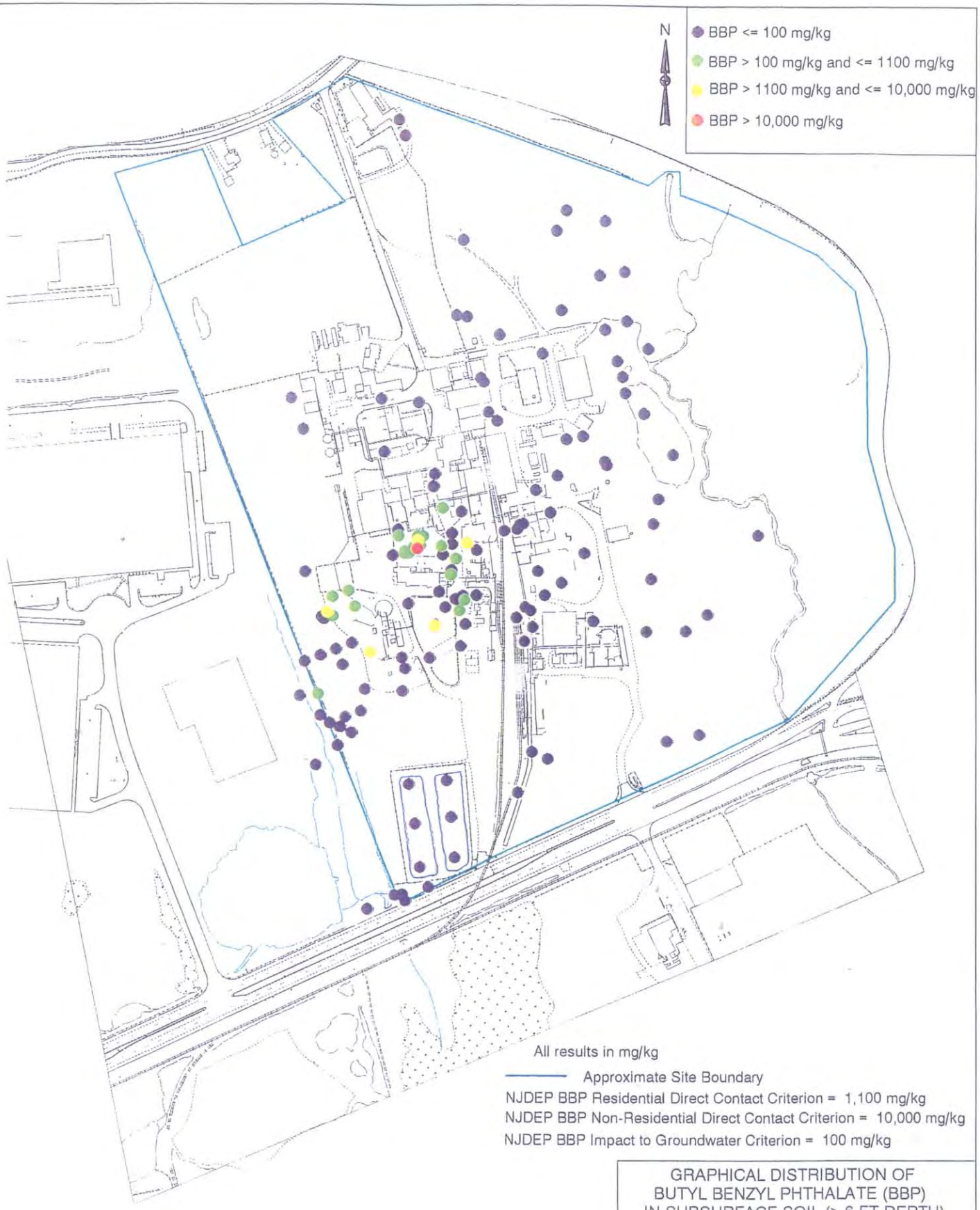
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-7



GRAPHICAL DISTRIBUTION OF
BUTYL BENZYL PHTHALATE (BBP)
IN SUBSURFACE SOIL (2 - 6 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

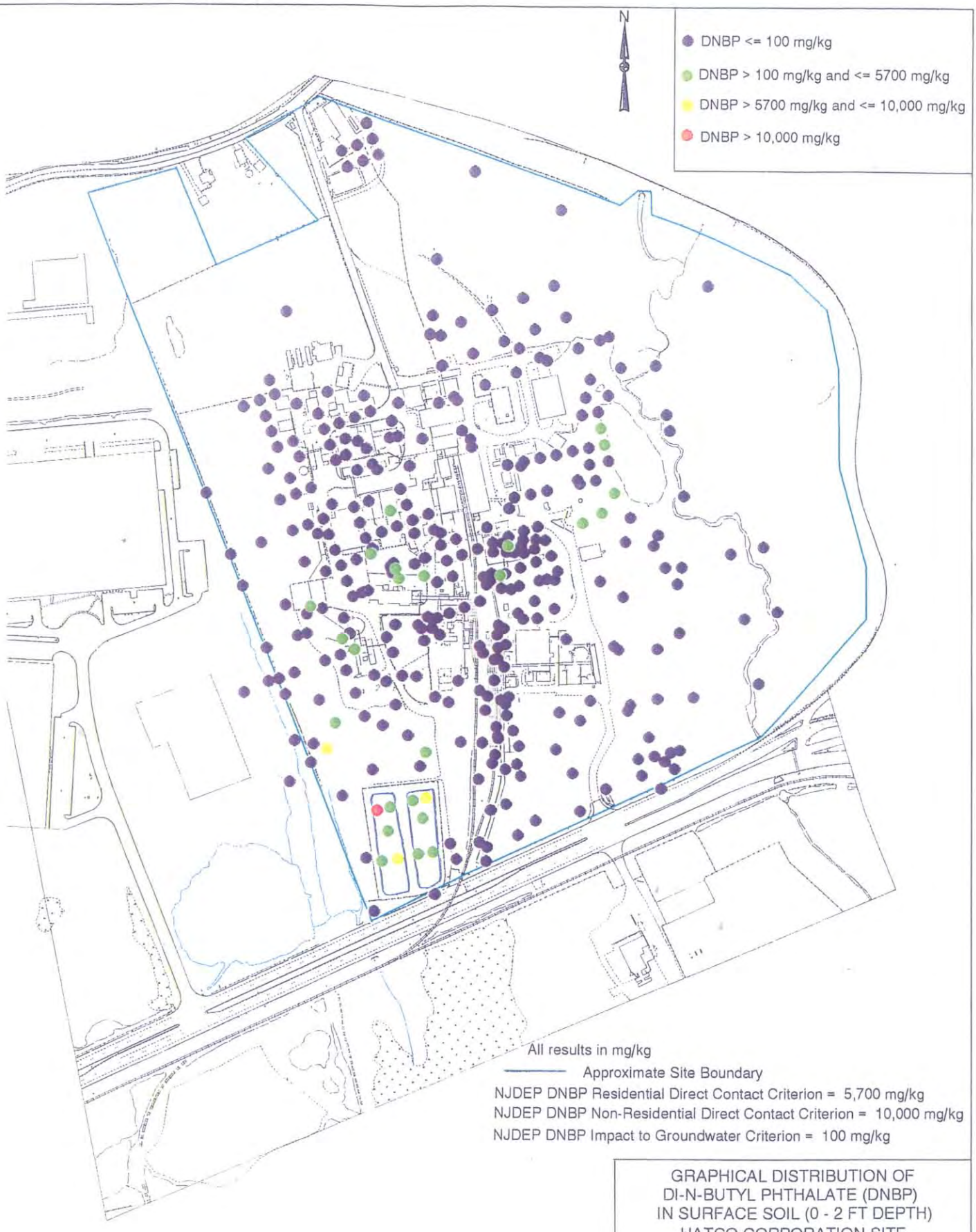
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-8



GRAPHICAL DISTRIBUTION OF
BUTYL BENZYL PHTHALATE (BBP)
IN SUBSURFACE SOIL (> 6 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

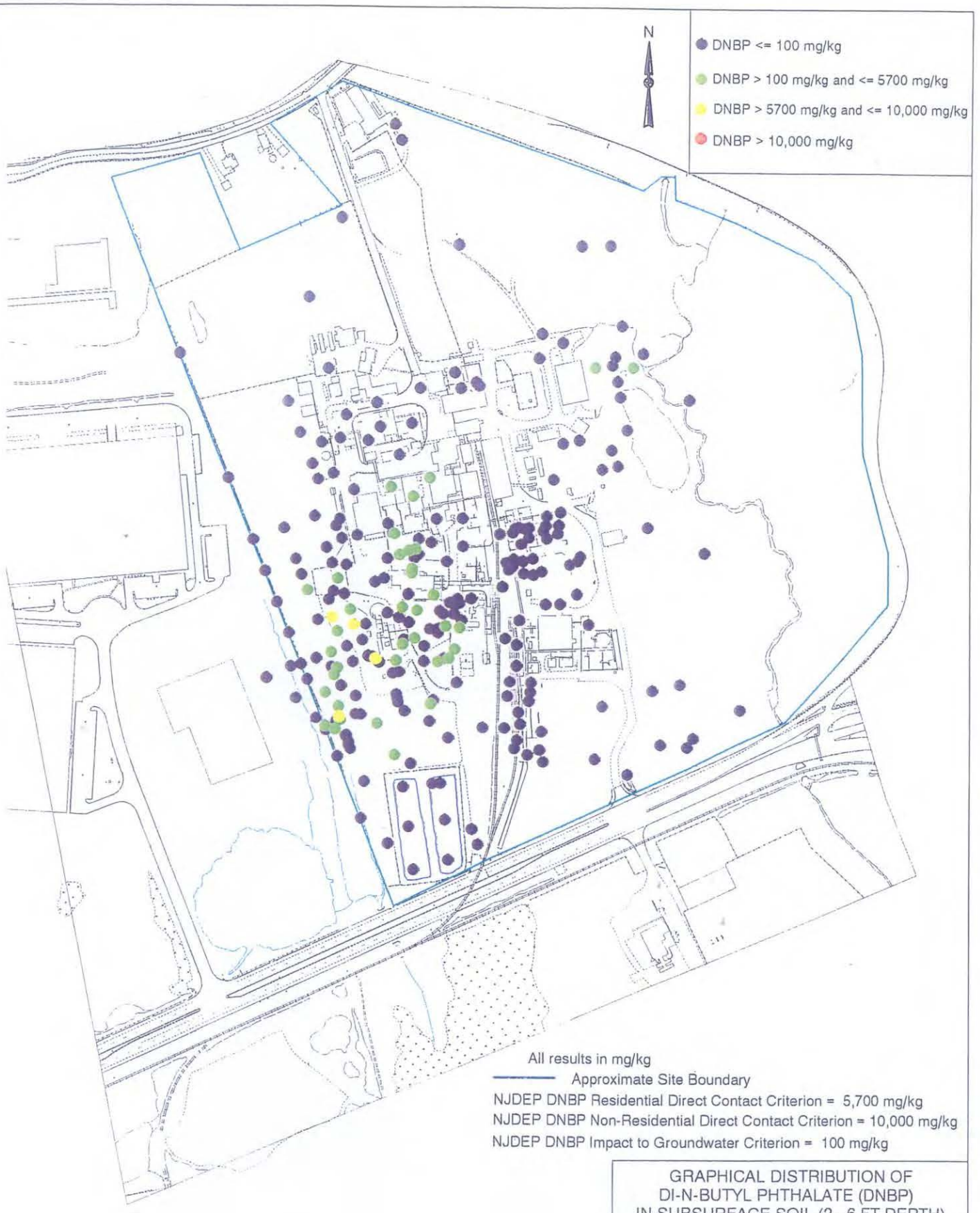
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04595
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-9



GRAPHICAL DISTRIBUTION OF
DI-N-BUTYL PHTHALATE (DNBP)
IN SURFACE SOIL (0 - 2 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

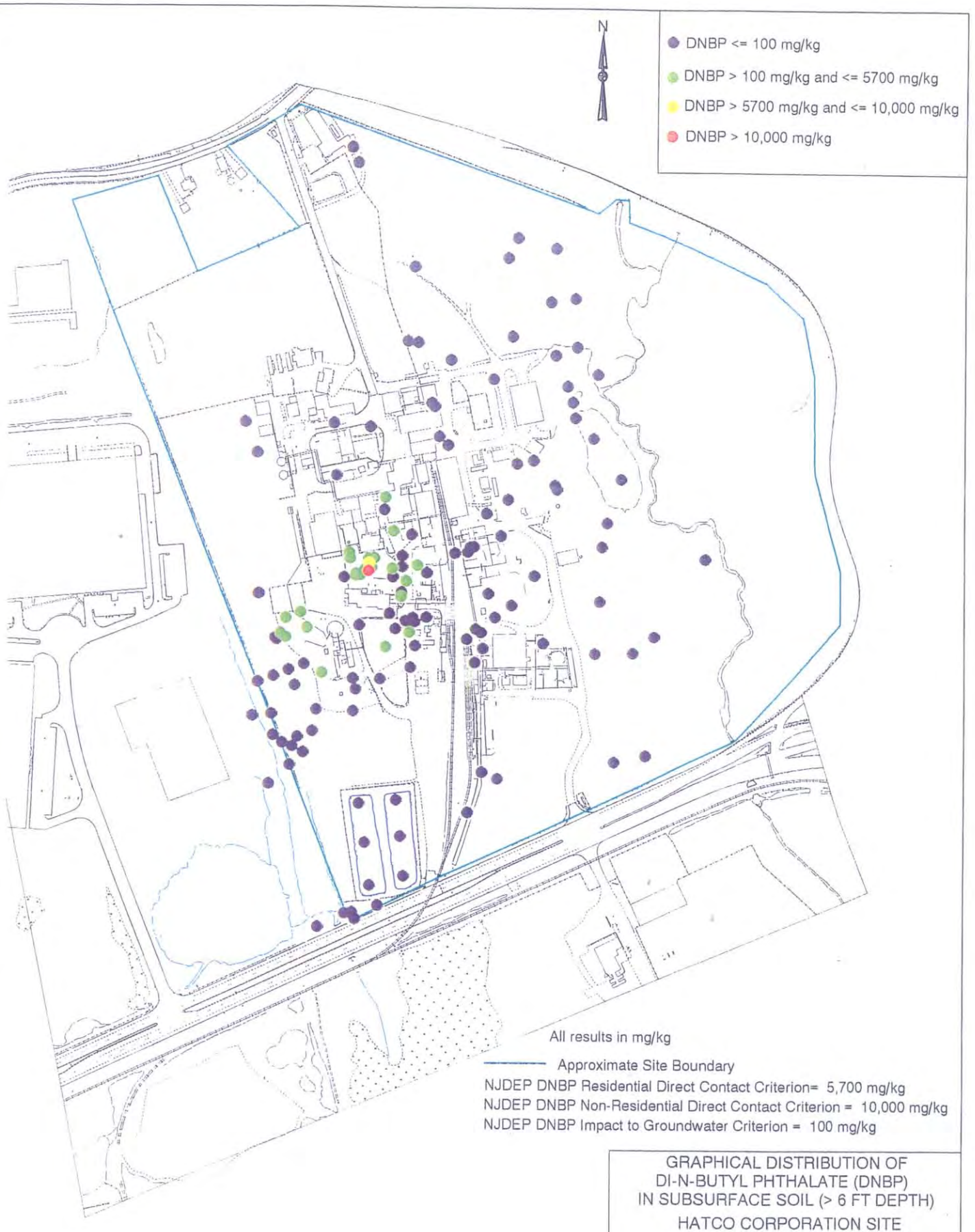
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-10



GRAPHICAL DISTRIBUTION OF
DI-N-BUTYL PHTHALATE (DNBP)
IN SUBSURFACE SOIL (2 - 6 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

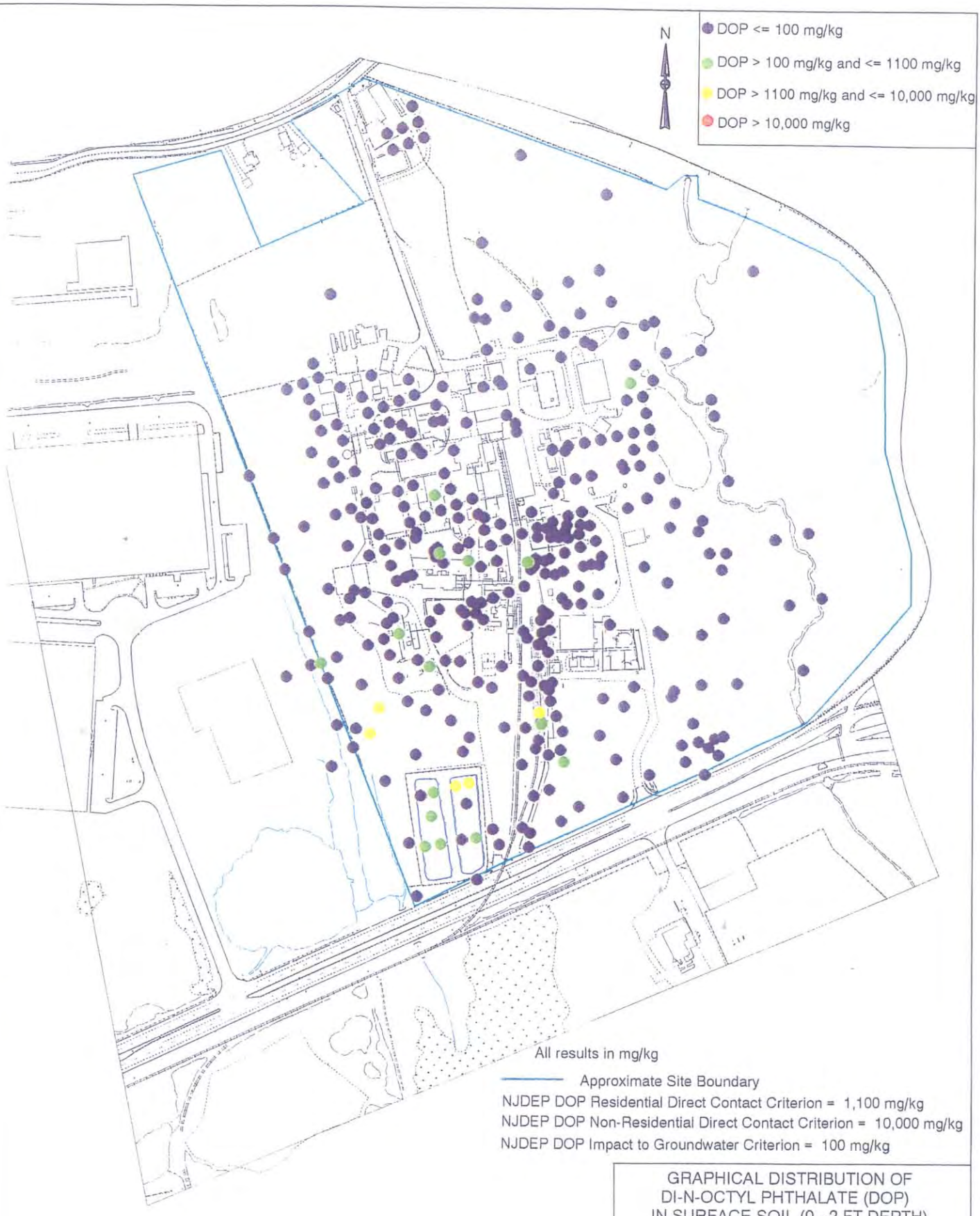
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: MARCH 20, 2001	FIG. NO. 3-11	



GRAPHICAL DISTRIBUTION OF
DI-N-BUTYL PHTHALATE (DNBP)
IN SUBSURFACE SOIL (> 6 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

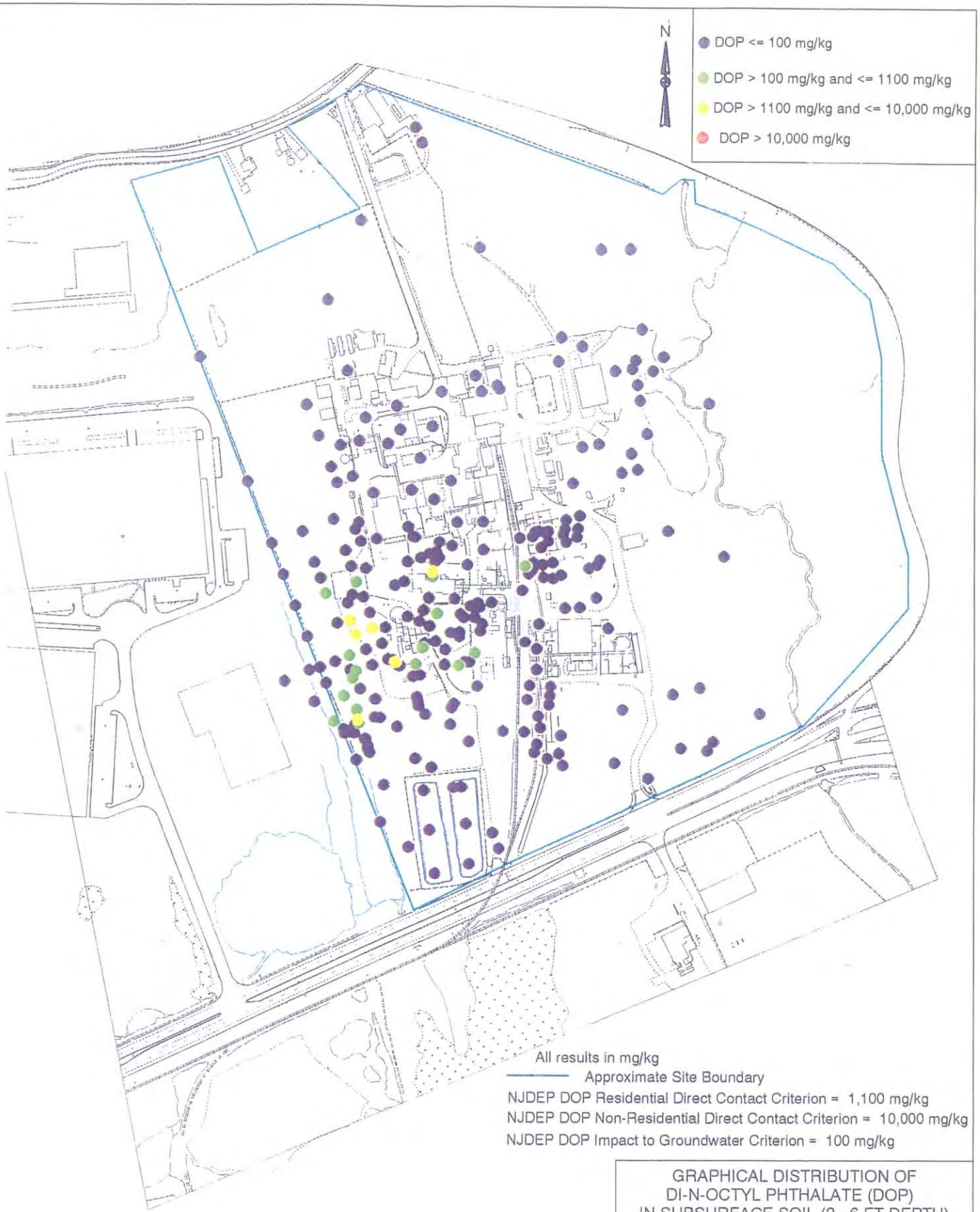
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-12



GRAPHICAL DISTRIBUTION OF
DI-N-OCTYL PHTHALATE (DOP)
IN SURFACE SOIL (0 - 2 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

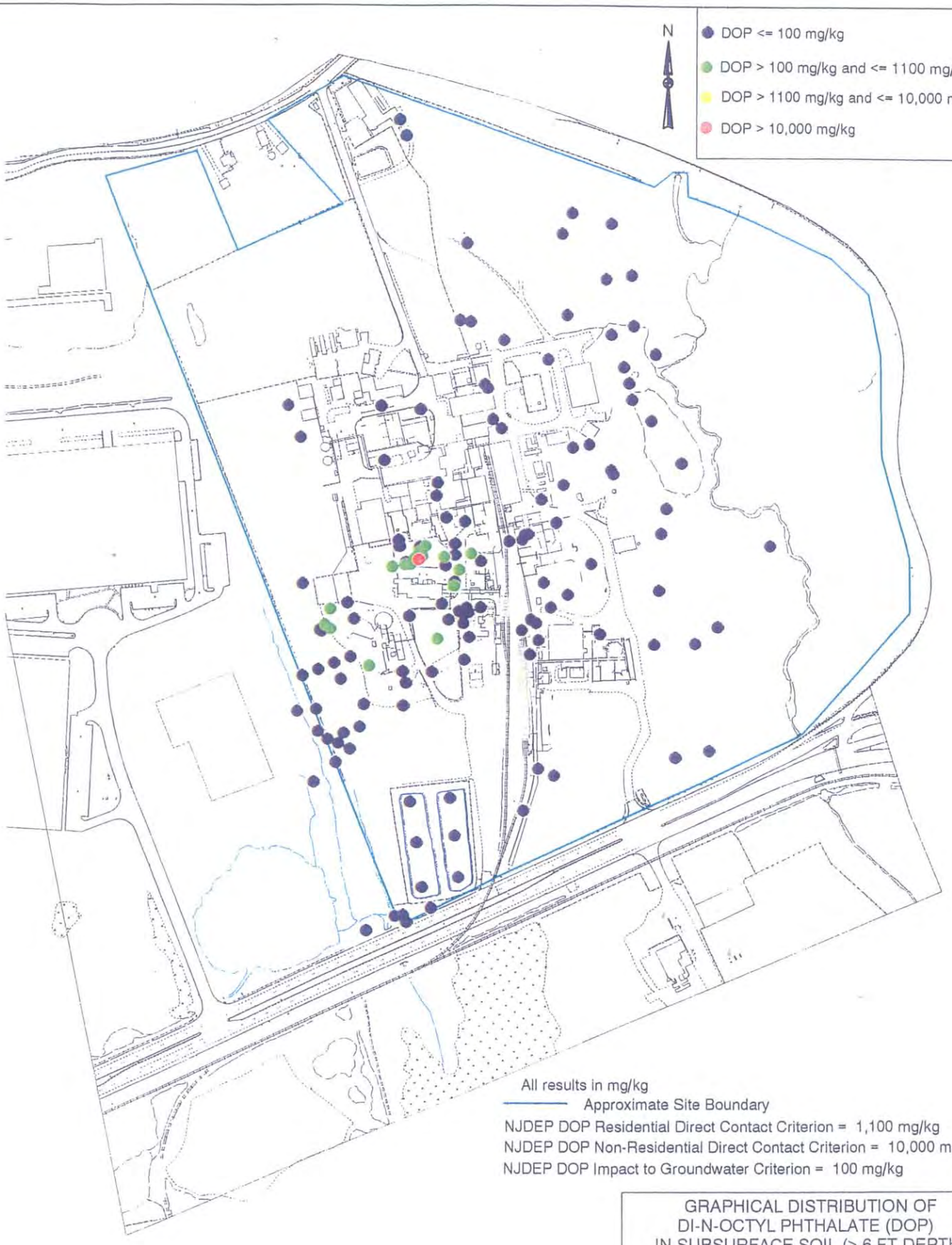
DR. BY RC	SCALE 1" = 400'	DWG. NO	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-13



GRAPHICAL DISTRIBUTION OF
DI-N-OCTYL PHTHALATE (DOP)
IN SUBSURFACE SOIL (2 - 6 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-14



GRAPHICAL DISTRIBUTION OF
DI-N-OCTYL PHTHALATE (DOP)
IN SUBSURFACE SOIL (> 6 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04695
CK'D. BY MEC	DATE: MARCH 20, 2001	FIG. NO. 3-15	

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - PETROLEUM HYDROCARBONS IN SURFACE SOILS (0 - 2 FT)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-16

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - PETROLEUM HYDROCARBONS IN SUBSURFACE SOIL (2 - 6 FT)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

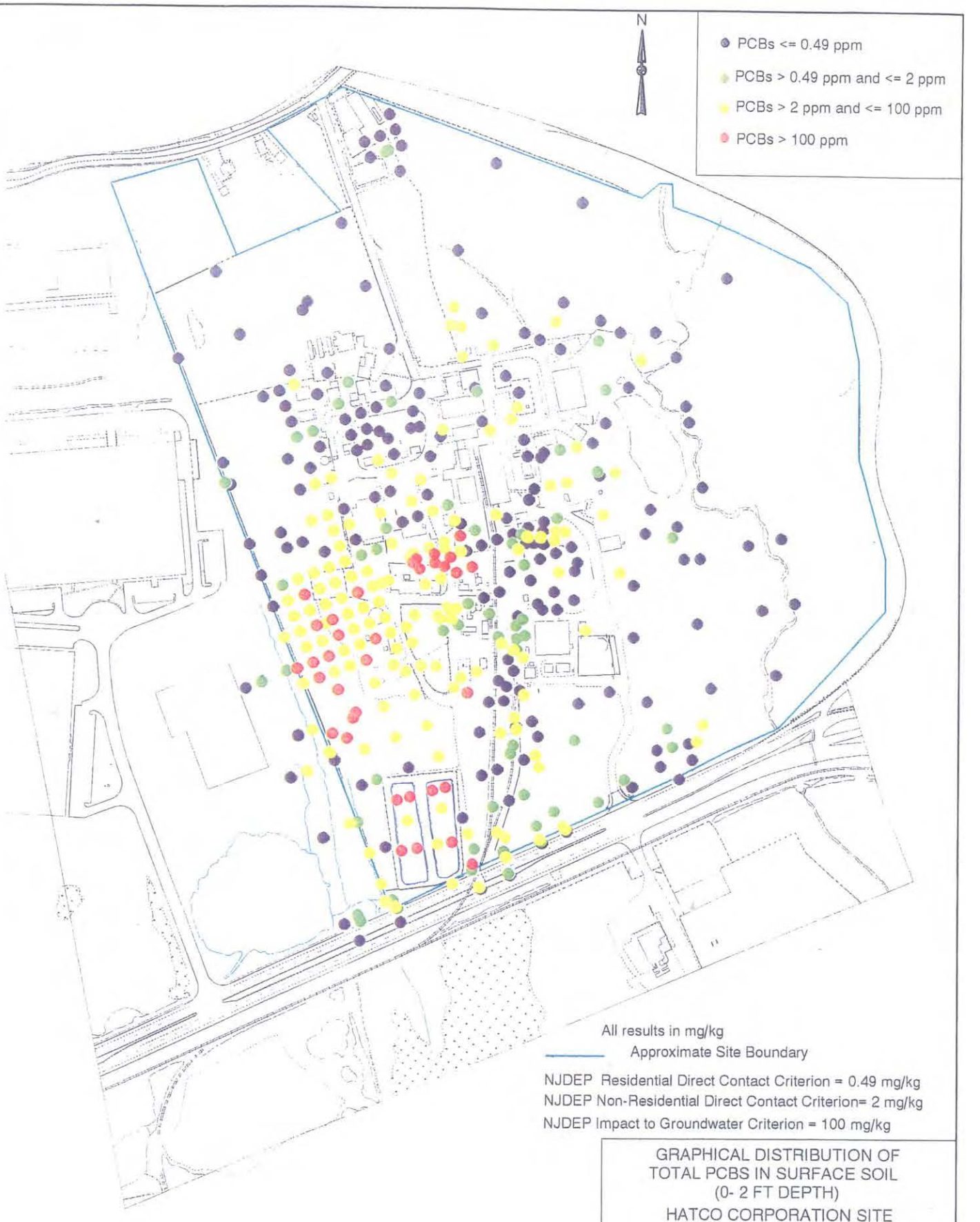
URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-17

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - PETROLEUM HYDROCARBONS IN SUBSURFACE SOIL (> 6 FT)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

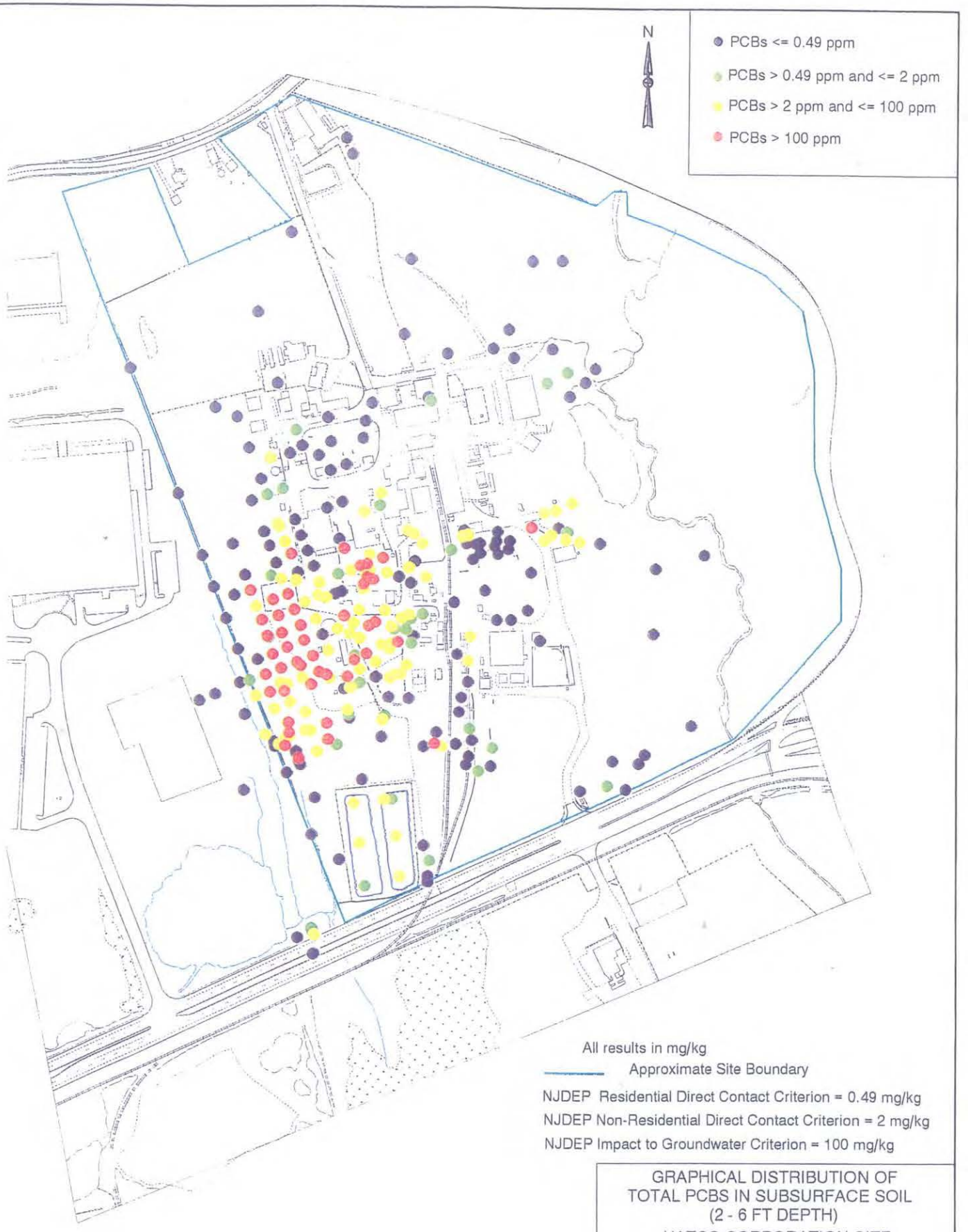
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: MARCH 20, 2001	FIG. NO. 3-18	



GRAPHICAL DISTRIBUTION OF
TOTAL PCBS IN SURFACE SOIL
(0- 2 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

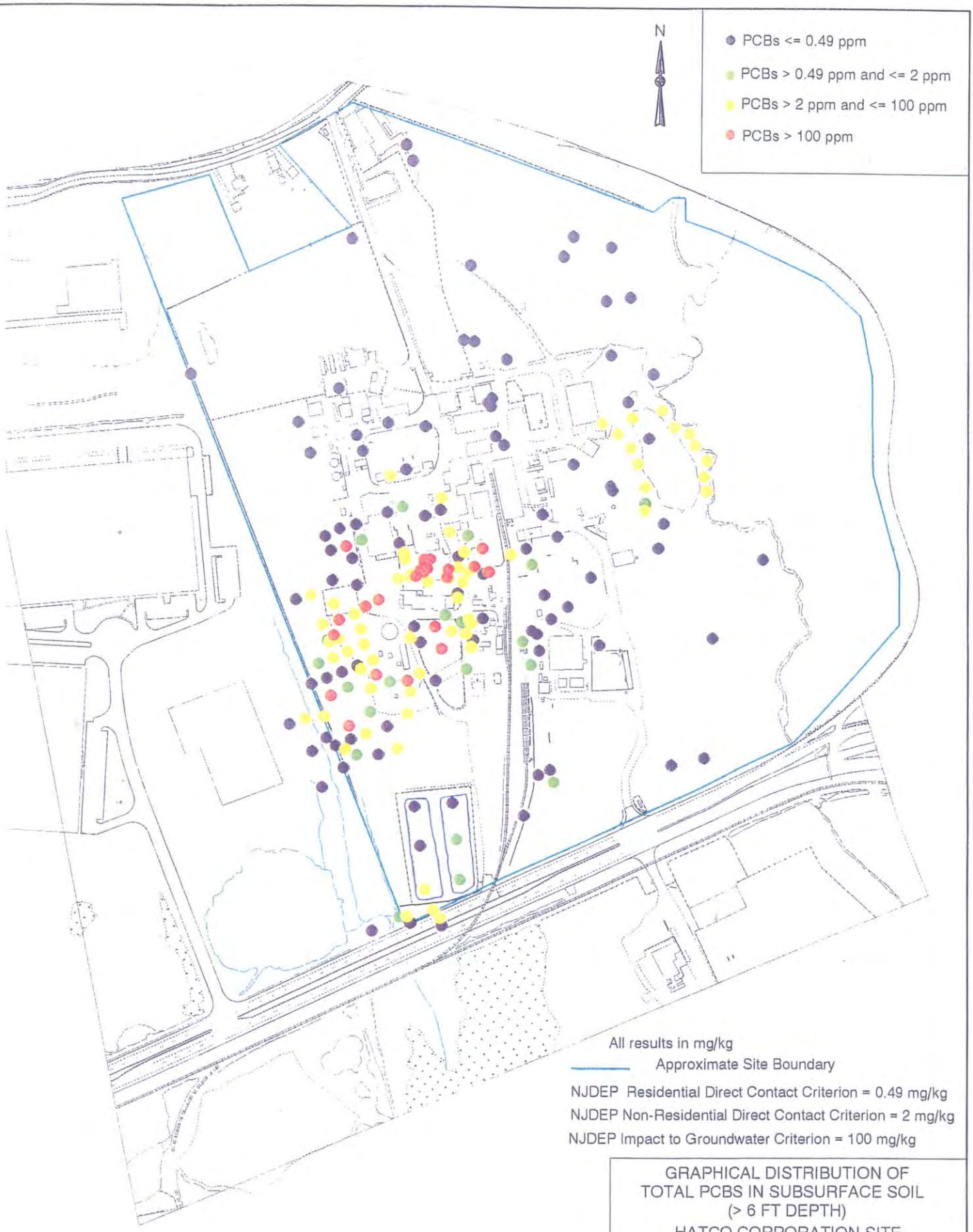
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY GRJ	DATE: MARCH 20, 2001		FIG. NO. 3-19



GRAPHICAL DISTRIBUTION OF
TOTAL PCBS IN SUBSURFACE SOIL
(2 - 6 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

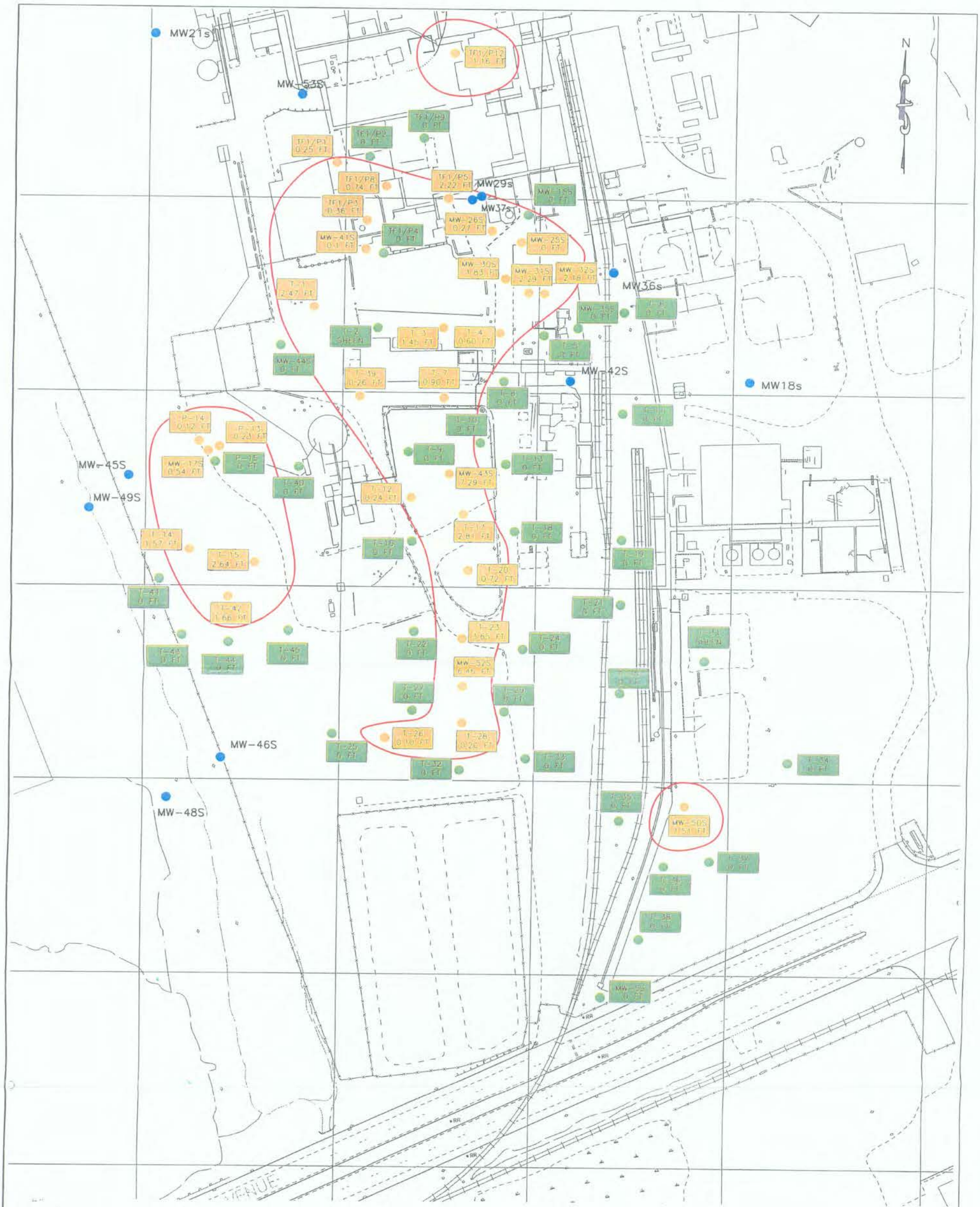
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-20



GRAPHICAL DISTRIBUTION OF
TOTAL PCBS IN SUBSURFACE SOIL
(> 6 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 3-21



LEGEND:

- WELLS AND TEMPORARY WELLS WITH NO LNAPL DETECTED OR SHEEN ONLY BASED ON MAY–JUNE 1999 MEASUREMENTS
- WELLS AND TEMPORARY WELLS THAT CONTAIN LNAPL BASED ON MAY–JUNE 1999 MEASUREMENTS
- WELLS SCREENED ACROSS THE WATER TABLE THAT CONTAIN NO EVIDENCE OF LNAPL BASED ON OCT–NOV 1998 MEASUREMENTS
- APPROXIMATE EXTENT OF LNAPL

0 125 250

SCALE (FEET)

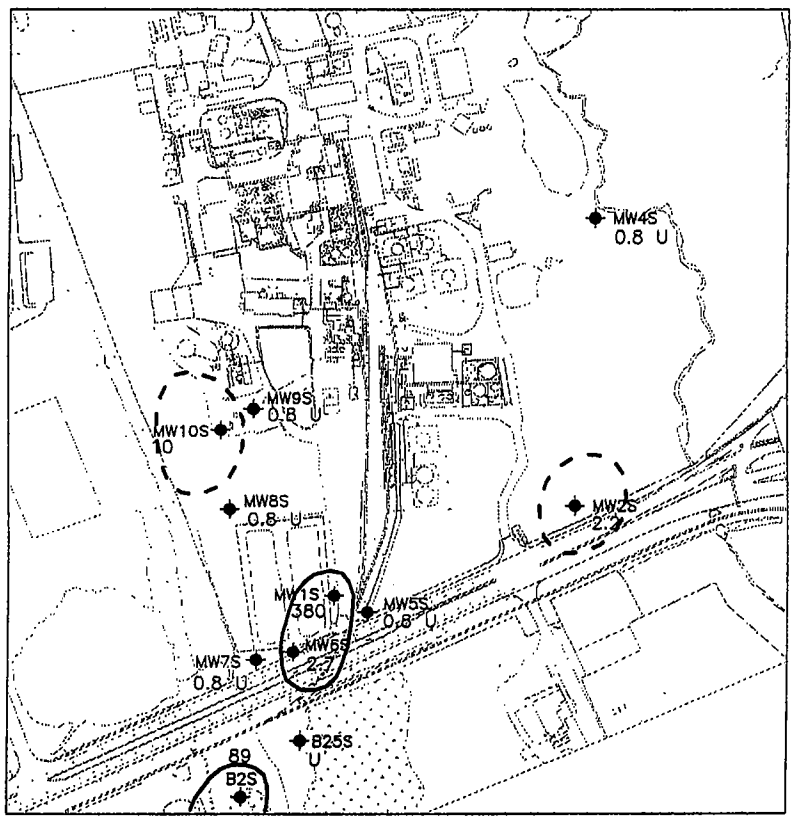
LNAPL DELINEATION SAMPLING RESULTS
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

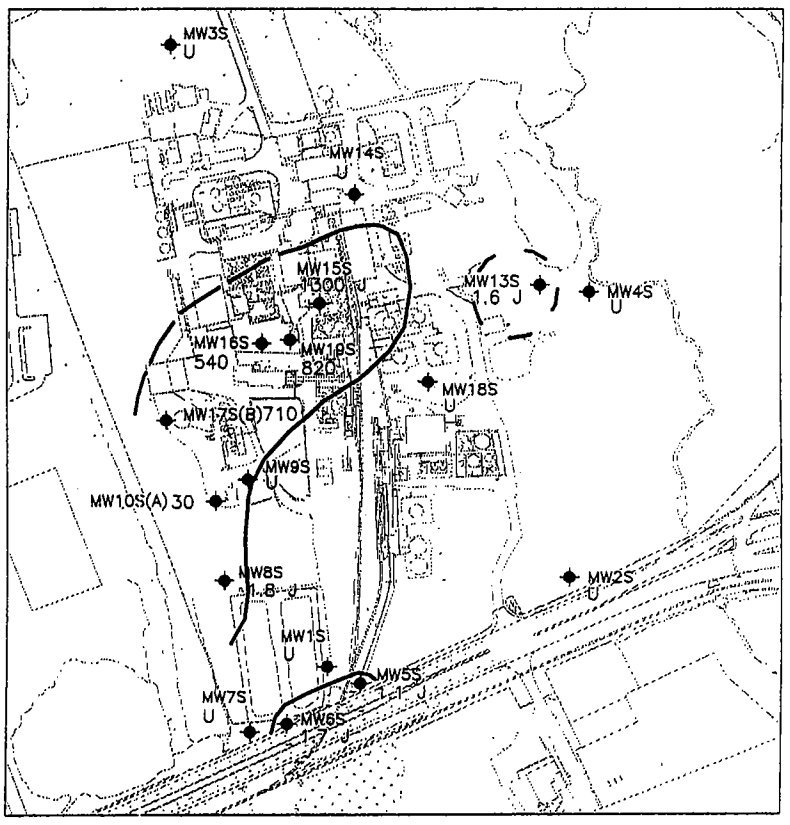
WAYNE, NEW JERSEY

DR. BY	DJK	SCALE	AS SHOWN	DWG. NO. 64695115	PROJ. NO. 6E04695
CK'D. BY	MG	DATE	JAN 11, 2001	FIG. NO.	3-22

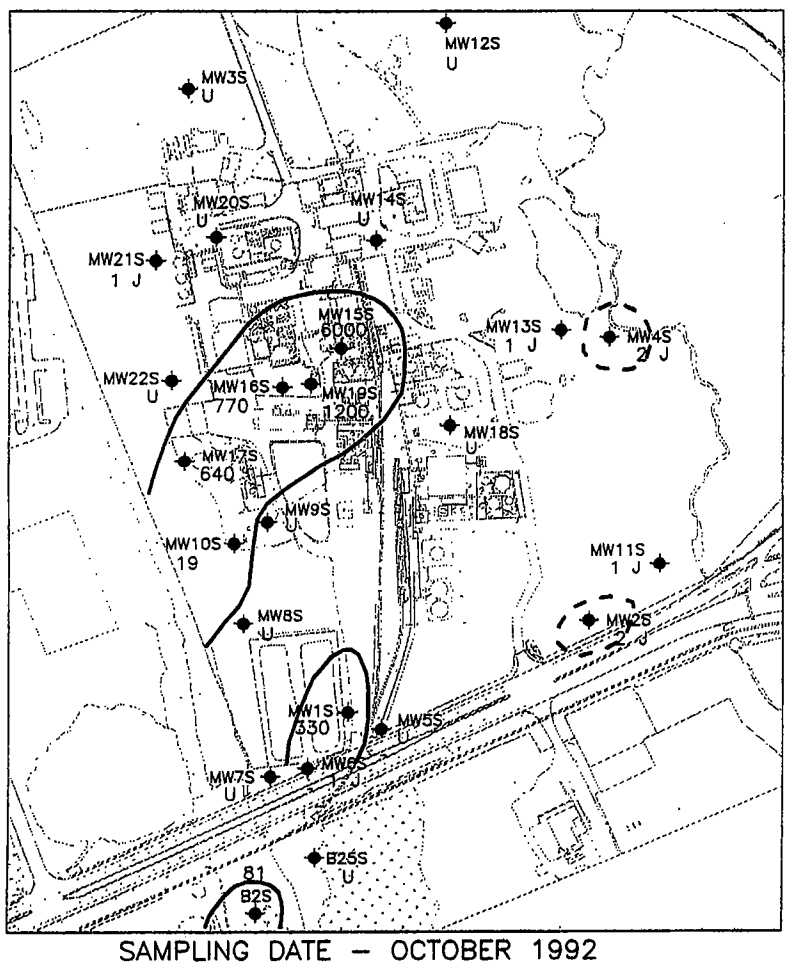
K:\CADD\6E04695\64695115.dwg, 03/26/2001 10:00:59 AM, 1:1



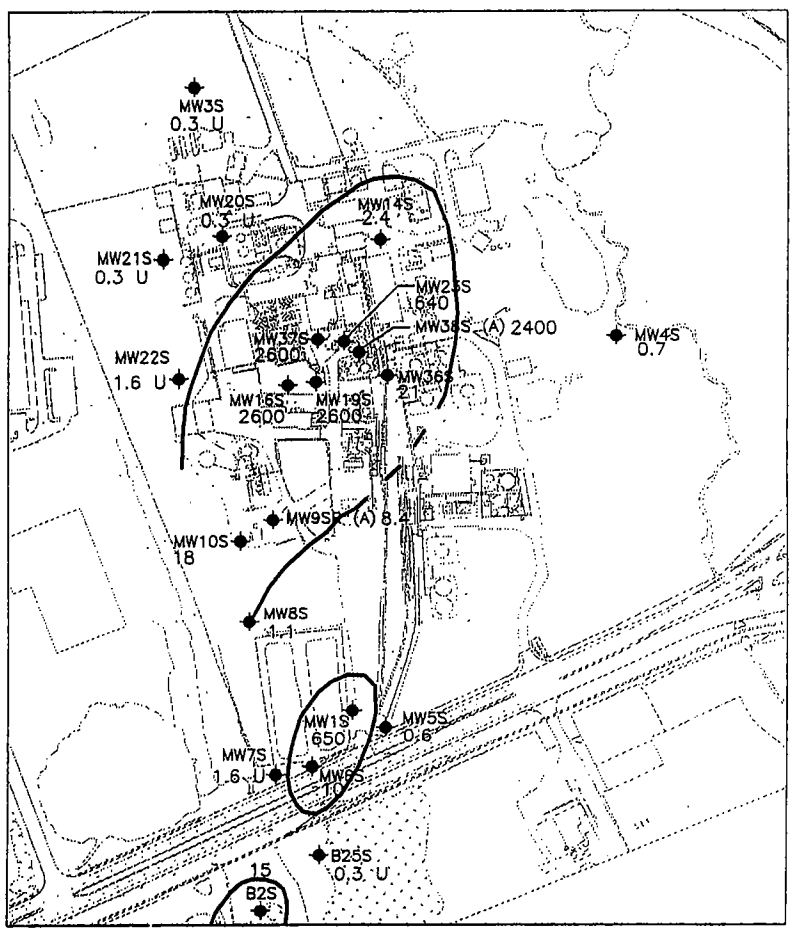
SAMPLING DATE – OCTOBER 1991



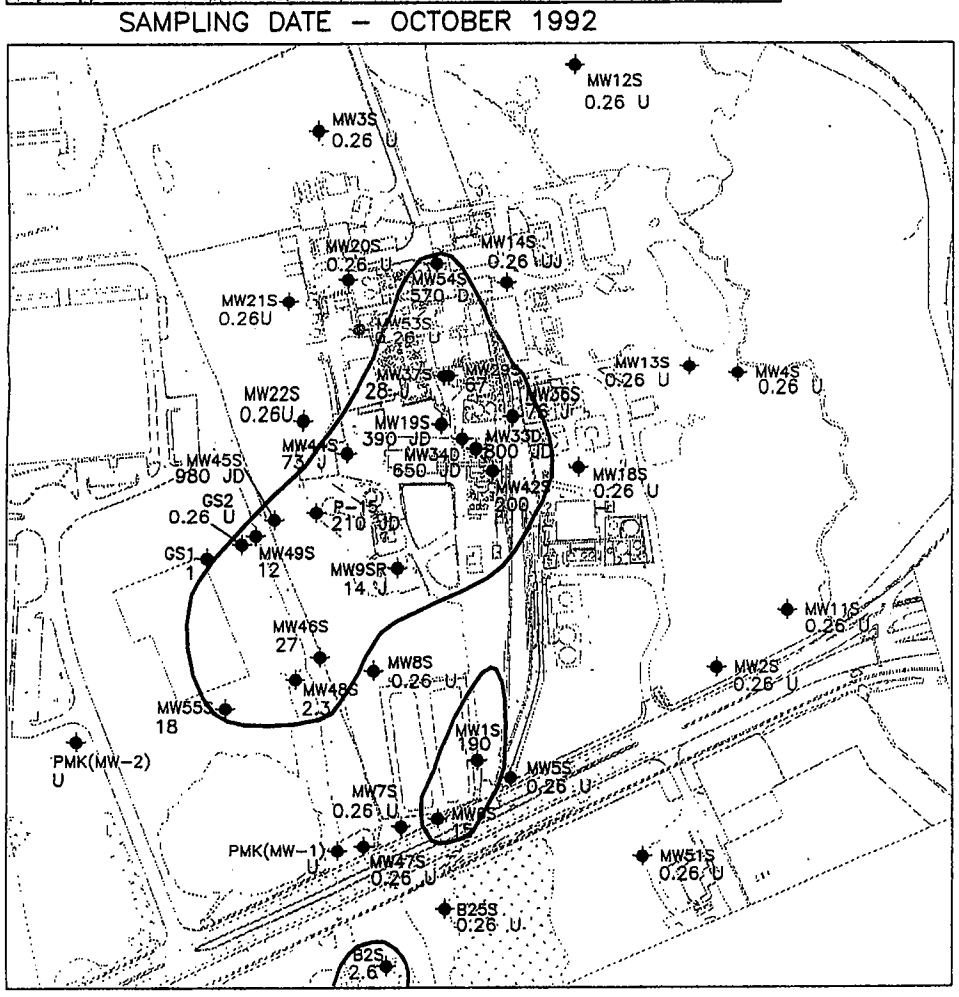
SAMPLING DATE – APRIL/MAY 1992



SAMPLING DATE – OCTOBER 1992



SAMPLING DATE – NOVEMBER 1994



SAMPLING DATE – OCTOBER/NOVEMBER 1998

LEGEND:

U = NOT DETECTED

J = ESTIMATED CONCENTRATION

D = DILUTED

1 UG/L CONCENTRATION CONTOUR (DASHED WHERE ESTIMATED)

ALL CONCENTRATIONS IN UG/L

N

NOTES:

1. NJDEP GROUNDWATER QUALITY STANDARD FOR BENZENE=1 UG/L
2. WELLS MW-33D AND MW-34D ARE SCREENED IN THE SHALLOW WATER-BEARING ZONE.

0 500 1000

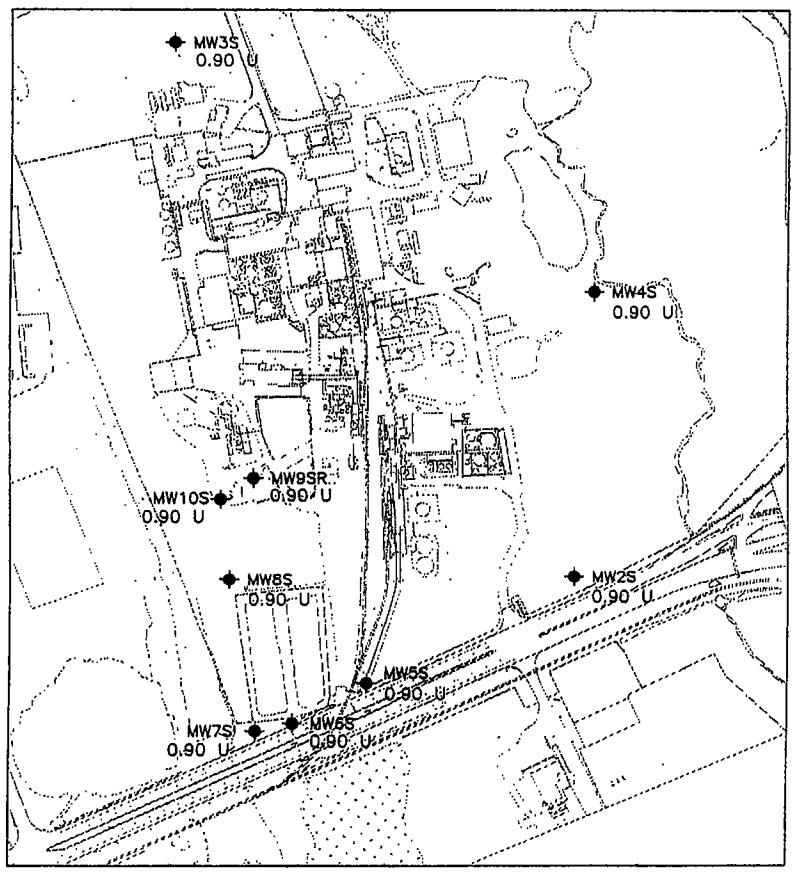
SCALE (FEET)

BENZENE CONCENTRATIONS IN SHALLOW GROUNDWATER HATCO CORPORATION SITE FORDS, NEW JERSEY

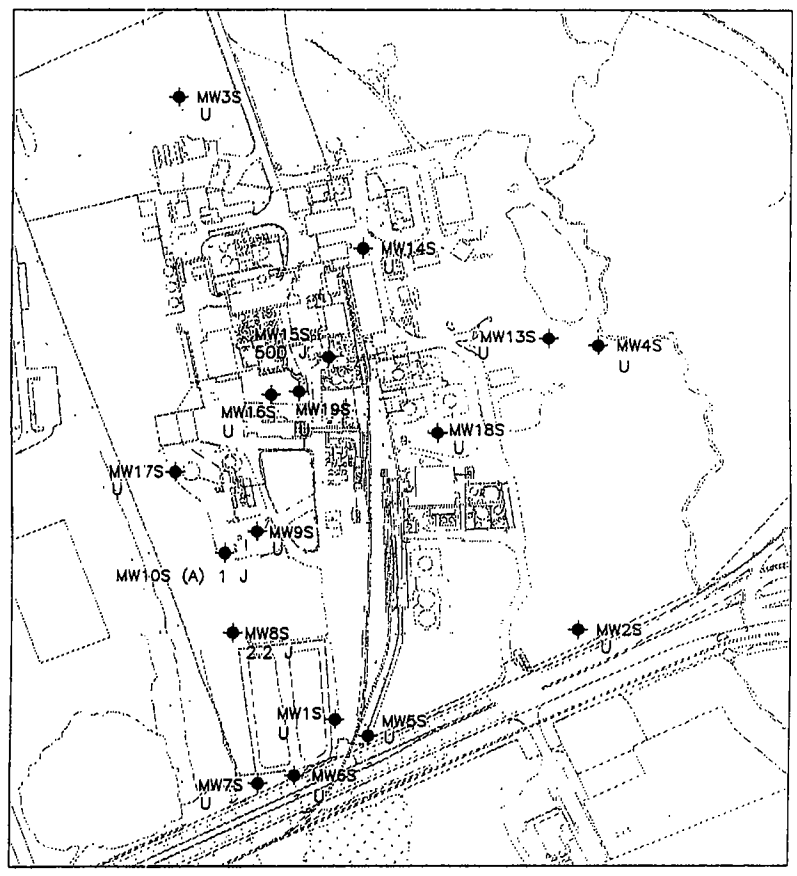
URS

WAYNE, NEW JERSEY

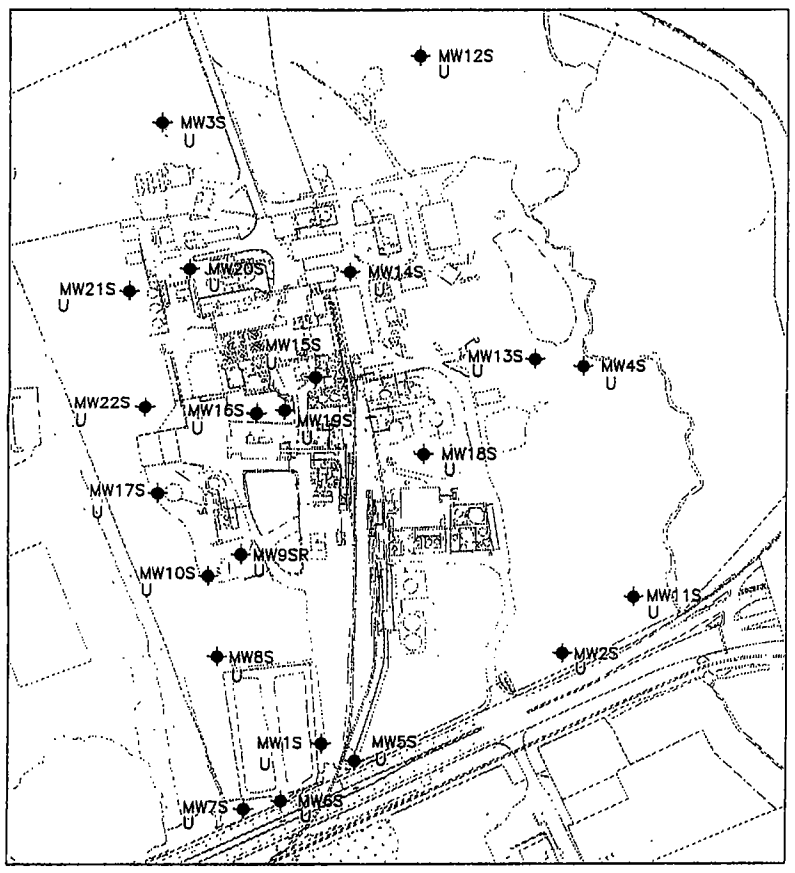
DR. BY	JL	SCALE	AS SHOWN	DWG. NO. 64695107	PROJ. NO. 6E04695
CK'D. BY	RC	DATE	JAN 11, 2001	FIG. NO.	3-23



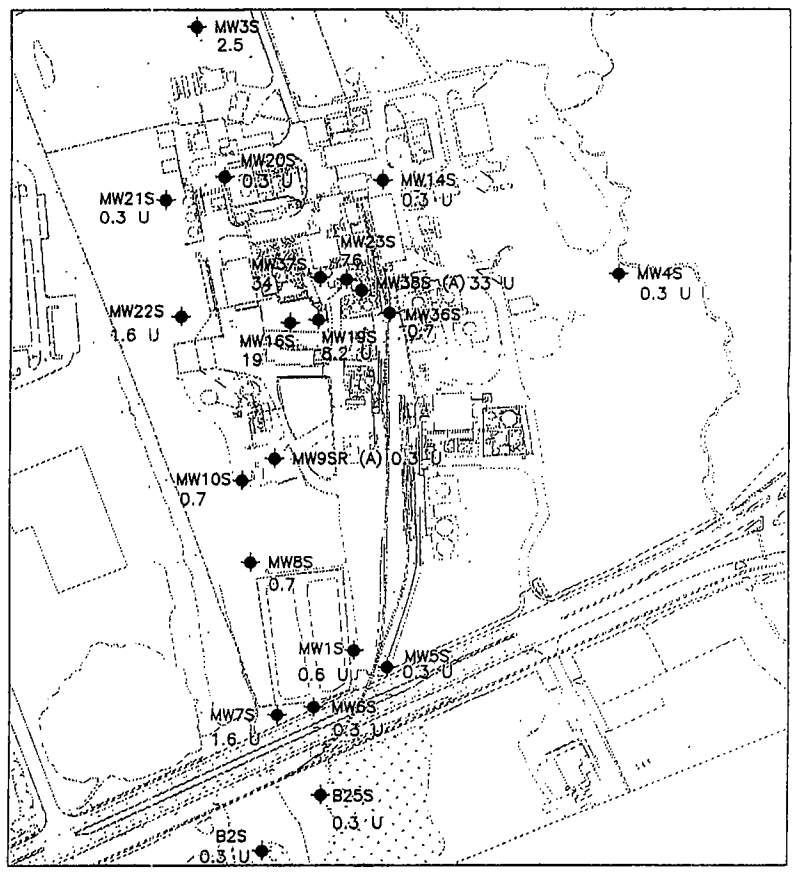
SAMPLING DATE – OCTOBER 1991



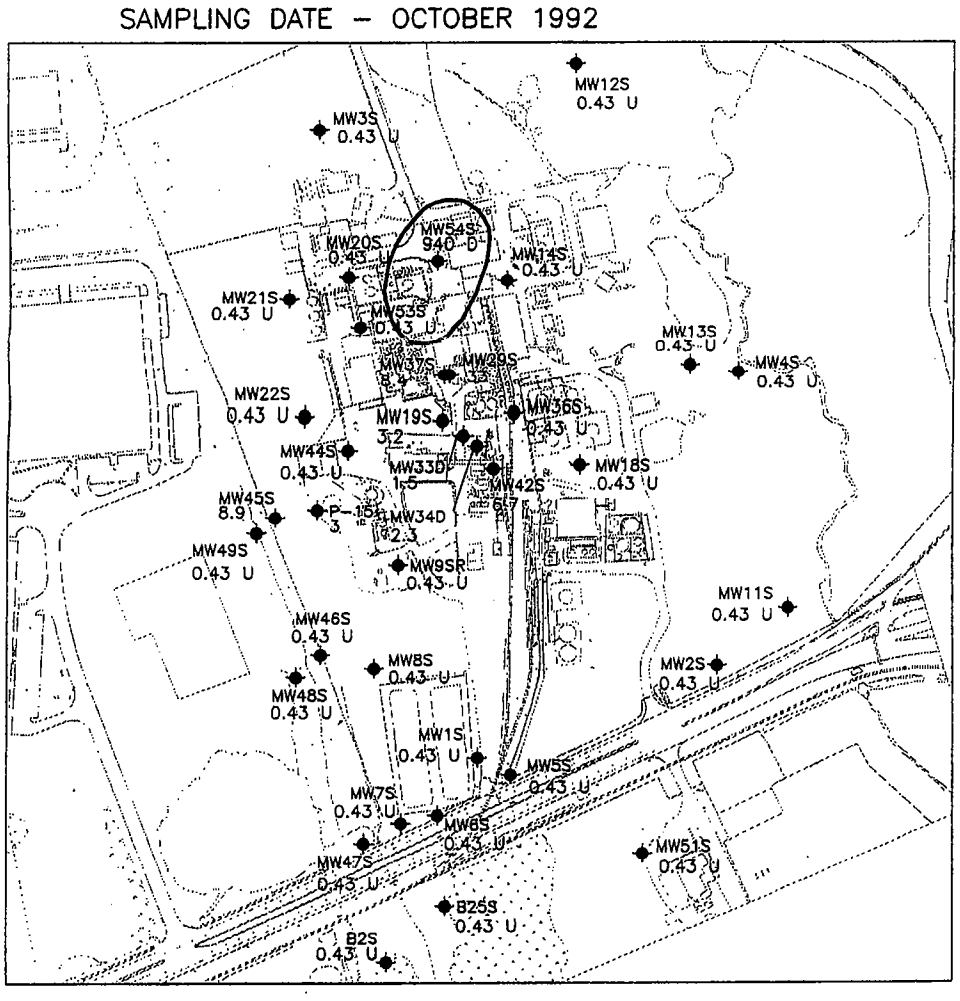
SAMPLING DATE – APRIL/MAY 1992



SAMPLING DATE – OCTOBER 1992



SAMPLING DATE – NOVEMBER 1994



SAMPLING DATE – OCTOBER/NOVEMBER 1998

N

LEGEND:

U = NOT DETECTED

J = ESTIMATED CONCENTRATION

D = DILUTED

700 UG/L CONCENTRATION CONTOUR (DASHED WHERE ESTIMATED)

ALL CONCENTRATIONS IN UG/L

NOTES:

1. NJDEP GROUNDWATER QUALITY STANDARD FOR ETHYLBENZENE=700 UG/L
2. WELLS MW-33D AND MW-34D ARE SCREENED IN THE SHALLOW WATER-BEARING ZONE.

0 500 1000

SCALE (FEET)

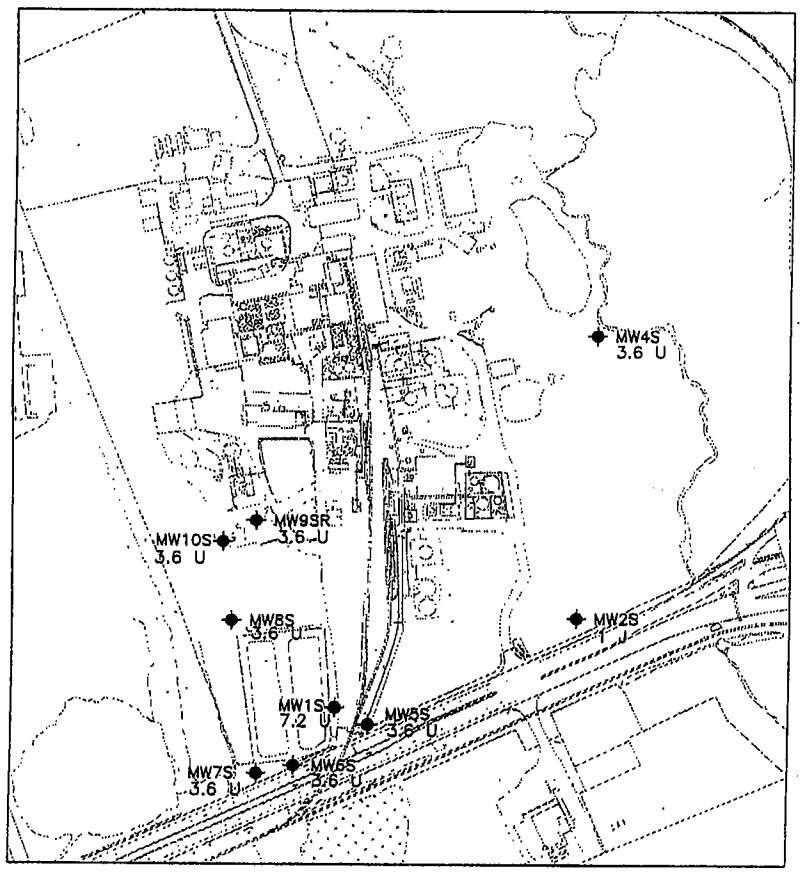
ETHYLBENZENE CONCENTRATIONS IN SHALLOW GROUNDWATER HATCO CORPORATION SITE FORDS, NEW JERSEY

URS

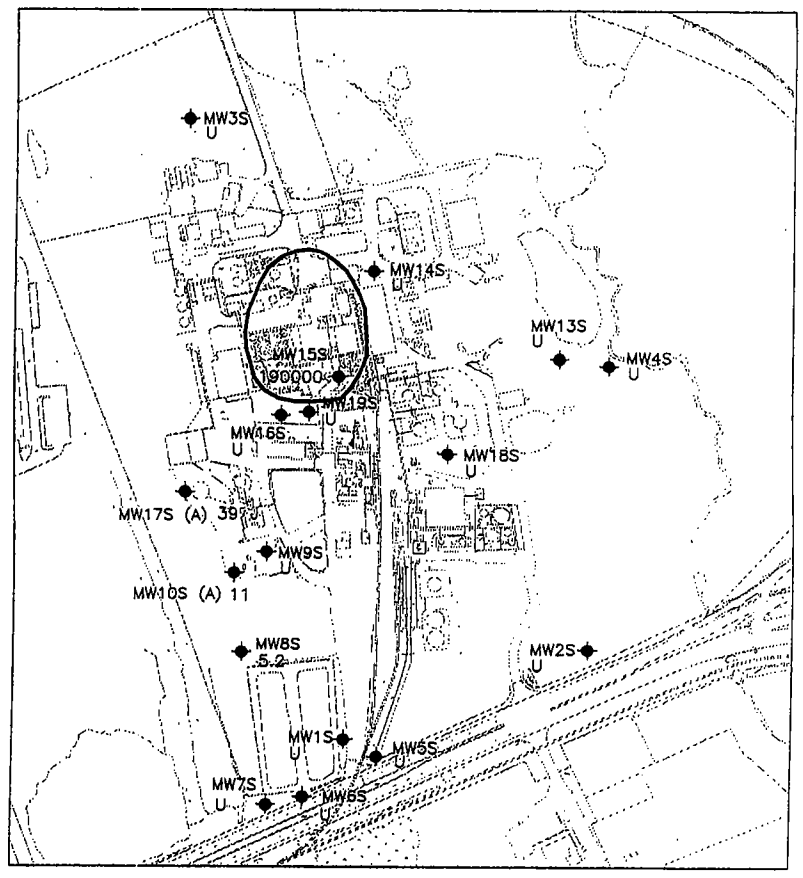
WAYNE, NEW JERSEY

DR. BY	JL	SCALE	AS SHOWN	DWG. NO. 64695116	PROJ. NO. 6E04695
CK'D. BY	RC	DATE	JAN 2, 2001	FIG. NO.	3-24

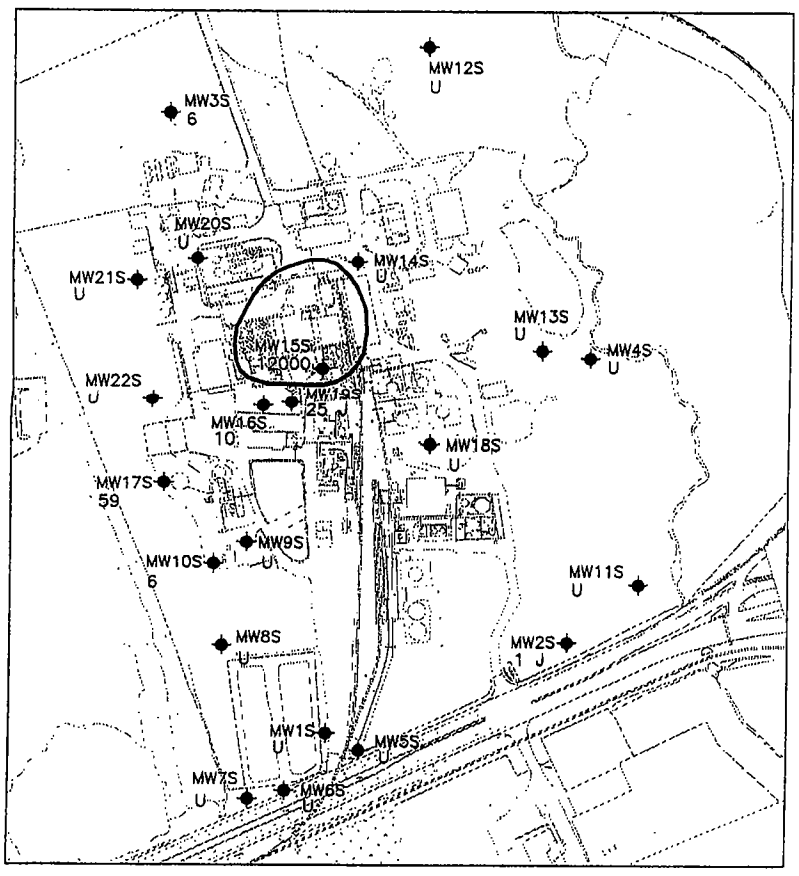
C:\...ADD\6E04695\64695116.dwg, 03/23/2001 10:03:45 AM, 1:1



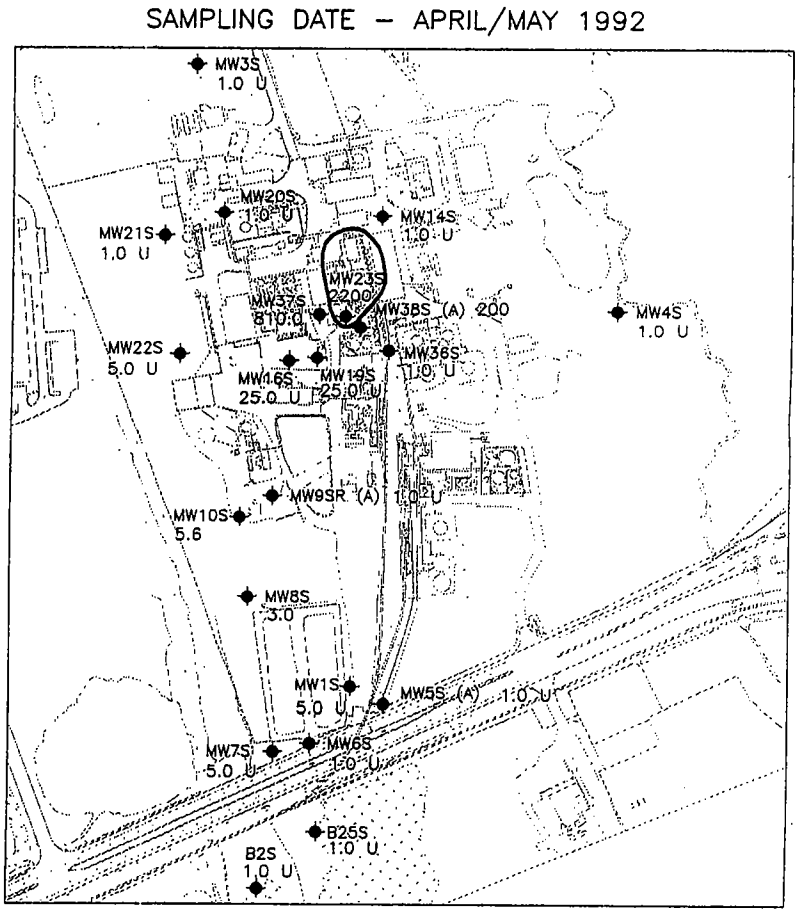
SAMPLING DATE – OCTOBER 1991



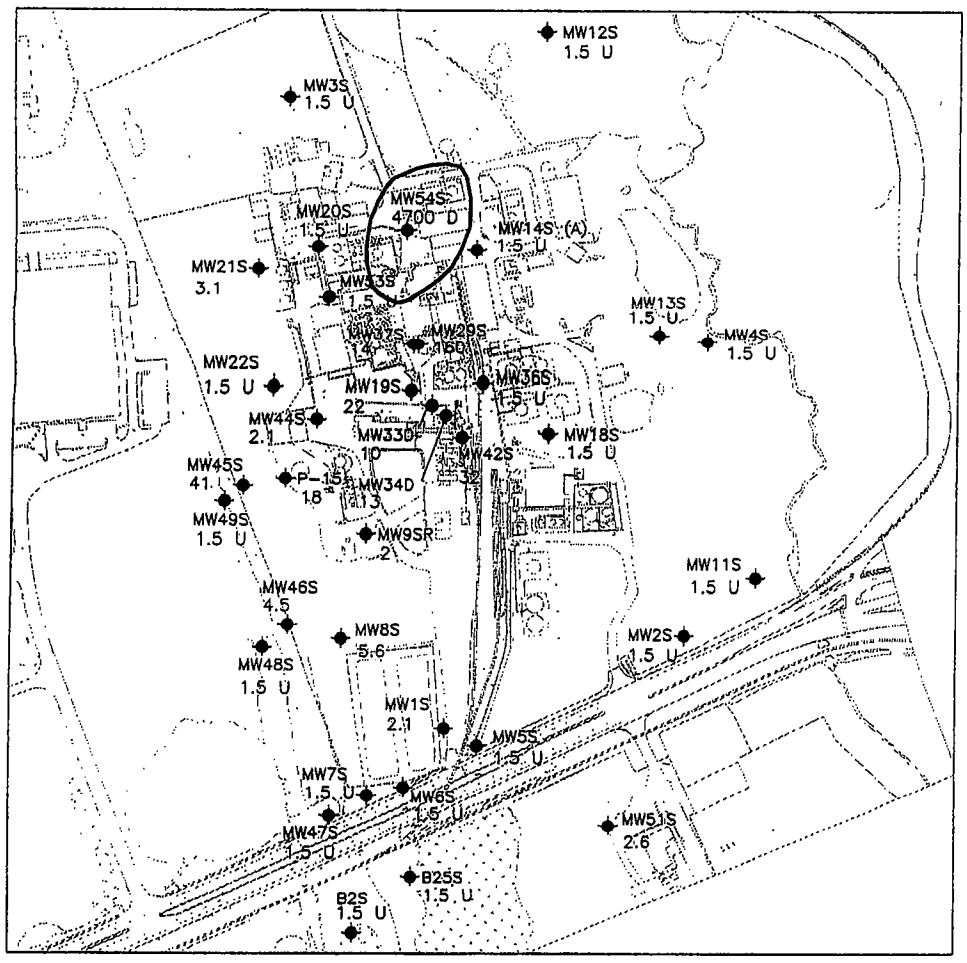
SAMPLING DATE – APRIL/MAY 1992



SAMPLING DATE – OCTOBER 1992



SAMPLING DATE – NOVEMBER 1994



SAMPLING DATE – OCTOBER/NOVEMBER 1998

LEGEND:

U = NOT DETECTED

J = ESTIMATED CONCENTRATION

–1000 UG/L CONCENTRATION CONTOUR (DASHED WHERE ESTIMATED)

ALL CONCENTRATIONS IN UG/L

N

NOTES:

1. NJDEP GROUNDWATER QUALITY STANDARD FOR TOTAL XYLENES=1000 UG/L
2. WELLS MW–33D AND MW–34D ARE SCREENED IN THE SHALLOW WATER–BEARING ZONE.

0 500 1000

SCALE (FEET)

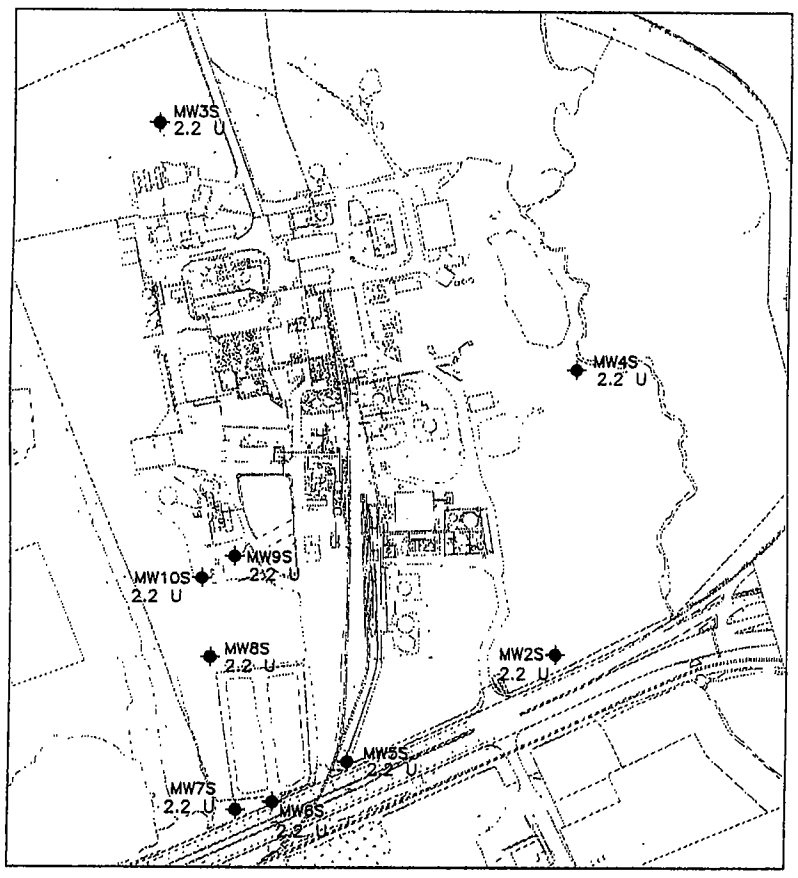
TOTAL XYLENES CONCENTRATIONS IN SHALLOW GROUNDWATER HATCO CORPORATION SITE FORDS, NEW JERSEY

URS

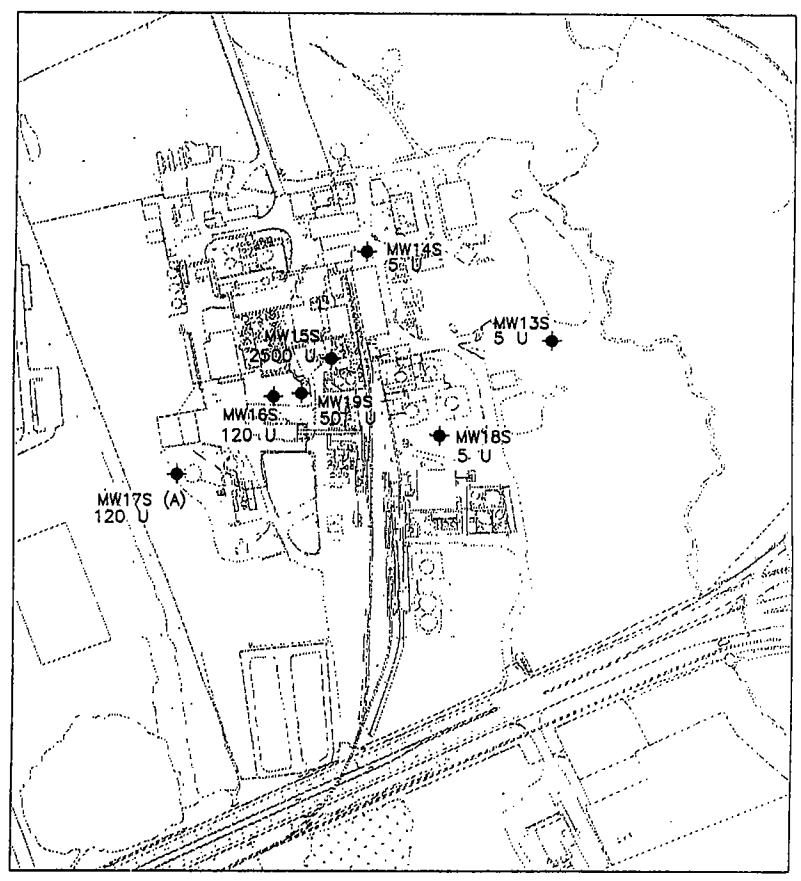
WAYNE, NEW JERSEY

DR. BY	JL	SCALE	AS SHOWN	DWG. NO.	64695118	PROJ. NO.	6E04695
CK'D. BY	RC	DATE	JAN 11, 2001	FIG. NO.	3–25		

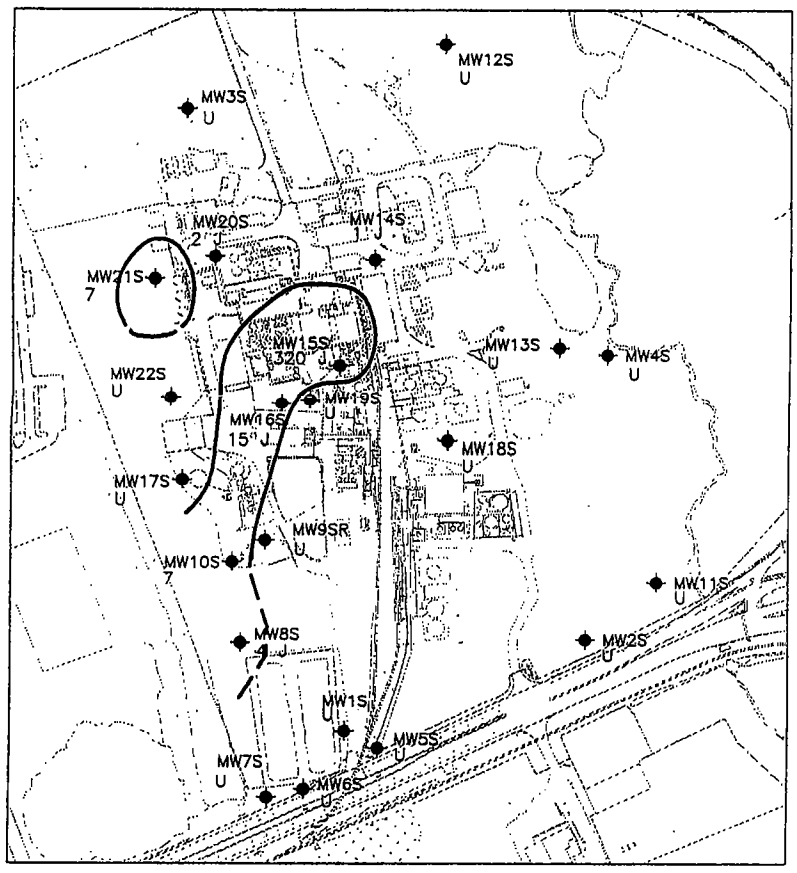
C:\...ADD\6E04695\64695118.dwg, 05/23/2001 10:12:14 AM, 1:1



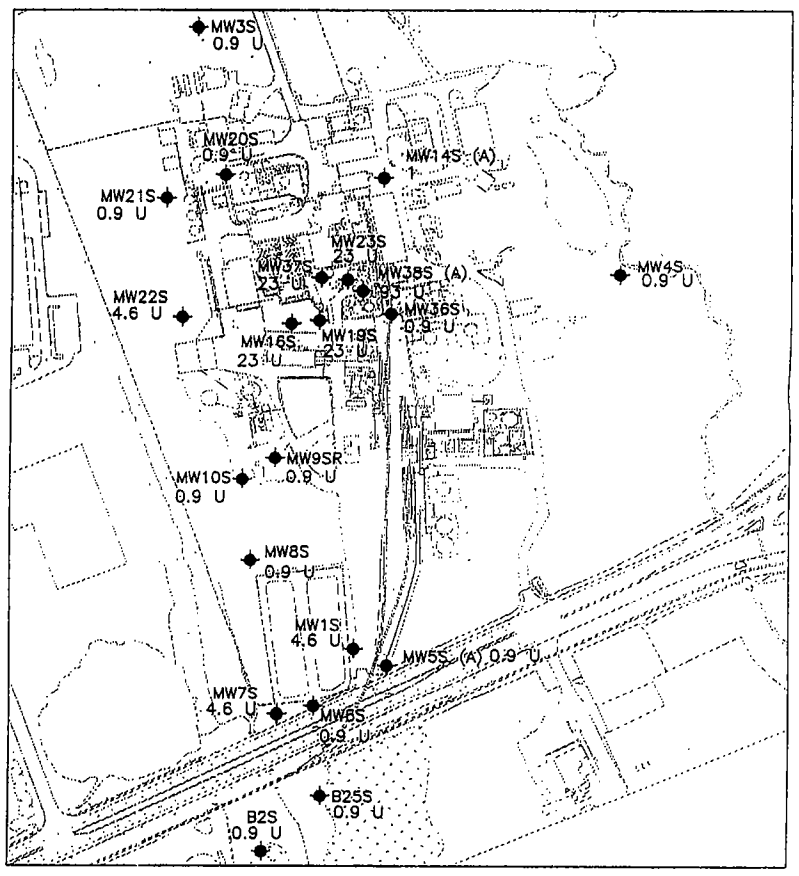
SAMPLING DATE – OCTOBER 1991



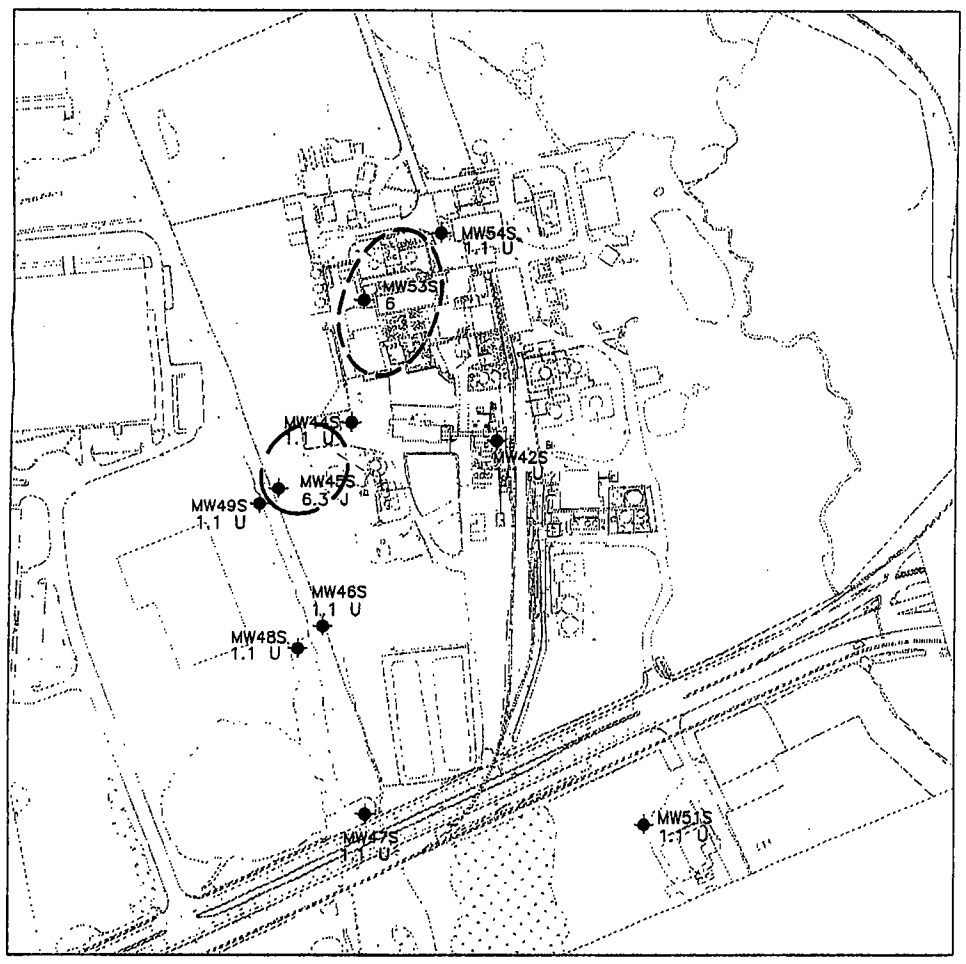
SAMPLING DATE – MAY 1992



SAMPLING DATE – OCTOBER 1992



SAMPLING DATE – NOVEMBER 1994



SAMPLING DATE – NOVEMBER 1998

LEGEND:

U = NOT DETECTED

J = ESTIMATED CONCENTRATION

D = DILUTED

– – 3 UG/L CONCENTRATION CONTOUR (DASHED WHERE ESTIMATED)

ALL CONCENTRATIONS IN UG/L

NOTES:

1. NJDEP GROUNDWATER QUALITY STANDARD FOR DICHLOROMETHANE=3 UG/L

N

0 500 1000

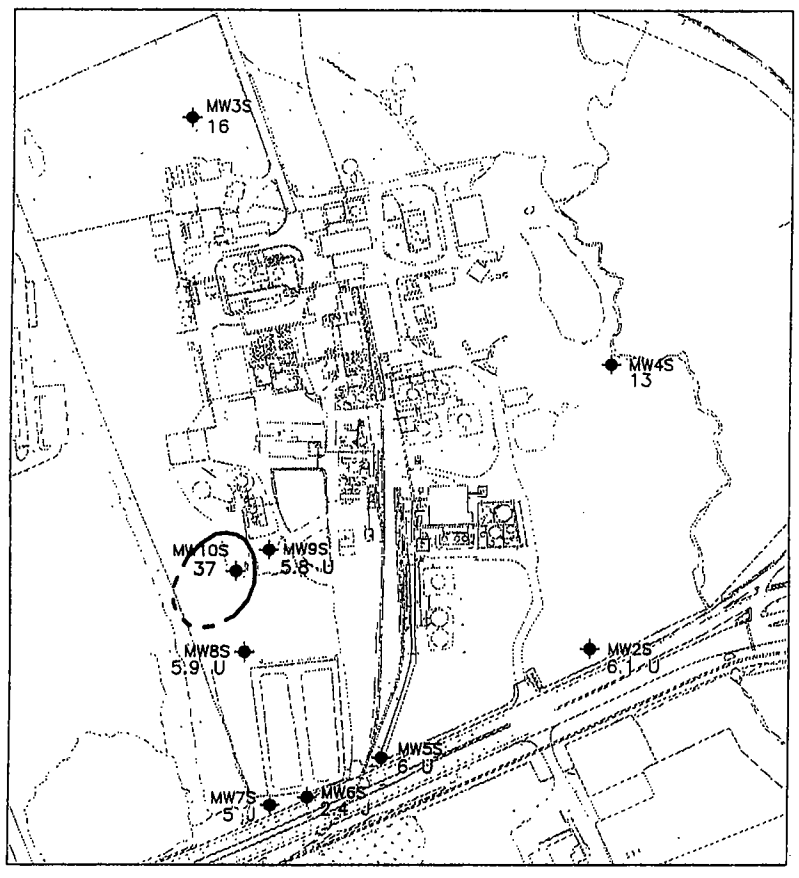
SCALE (FEET)

DICHLOROMETHANE CONCENTRATIONS IN SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

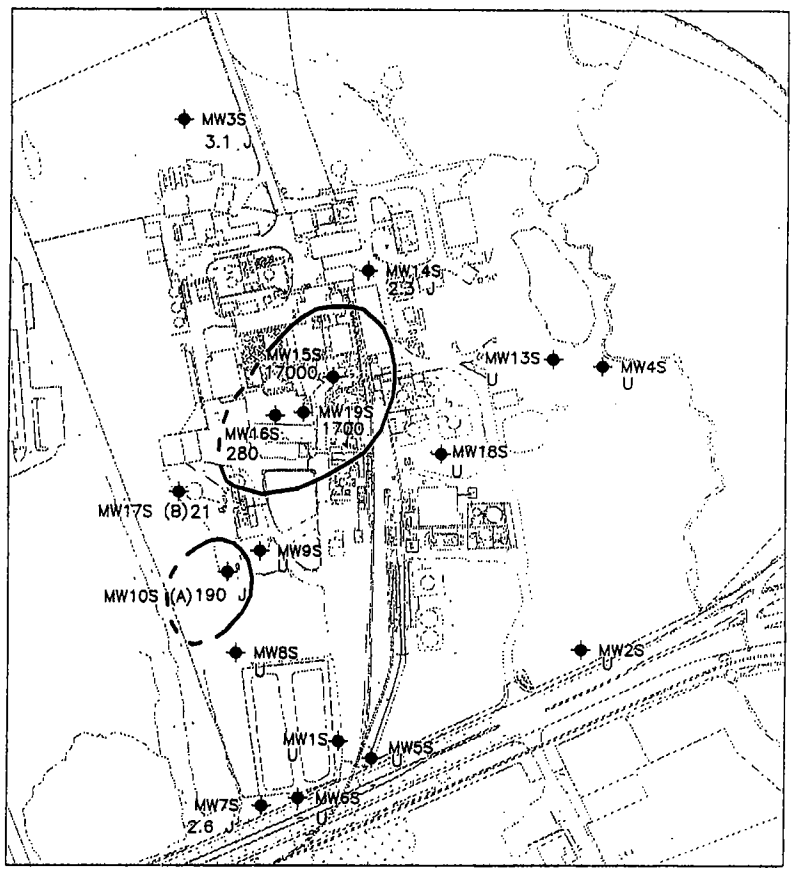
URS
WAYNE, NEW JERSEY

DR. BY	JL	SCALE	AS SHOWN	DWG. NO. 64695131	PROJ. NO. 6E04695
CK'D. BY	RC	DATE	JAN 22, 2001	FIG. NO.	3-26

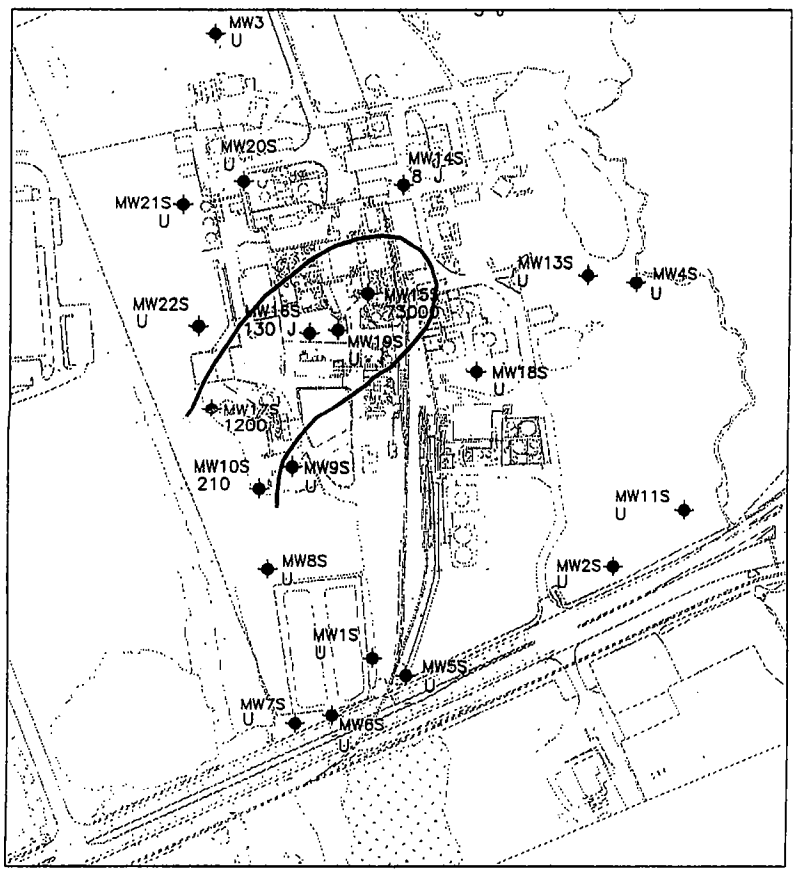
K:\L_AGD\6E04695\64695131.dwg, 03/23/2001 10:14:43 AM, 1:1



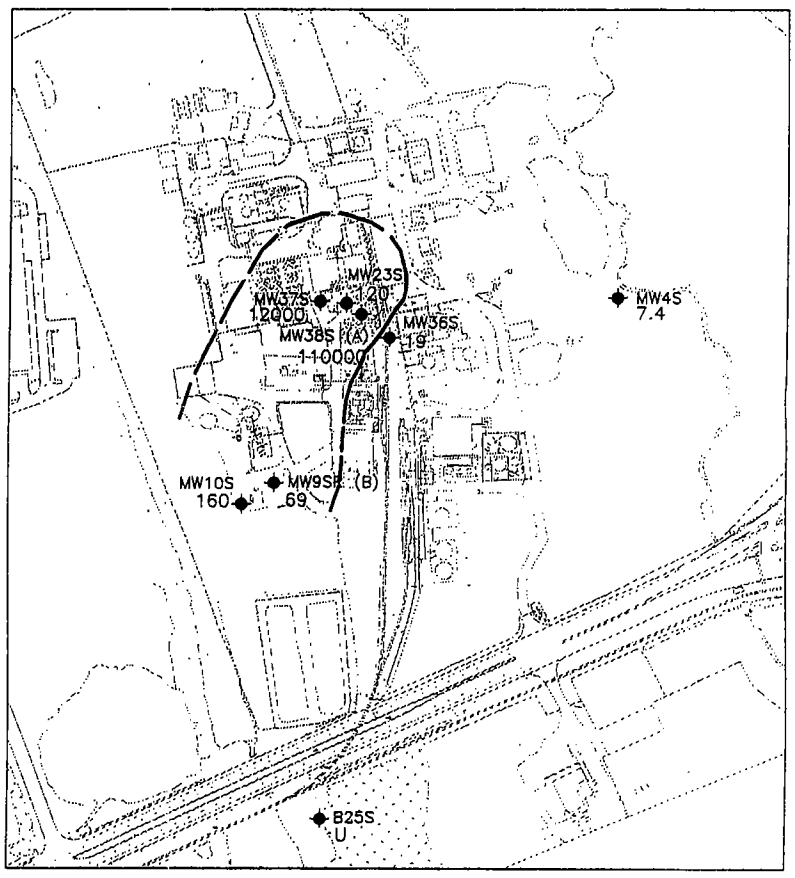
SAMPLING DATE – OCTOBER 1991



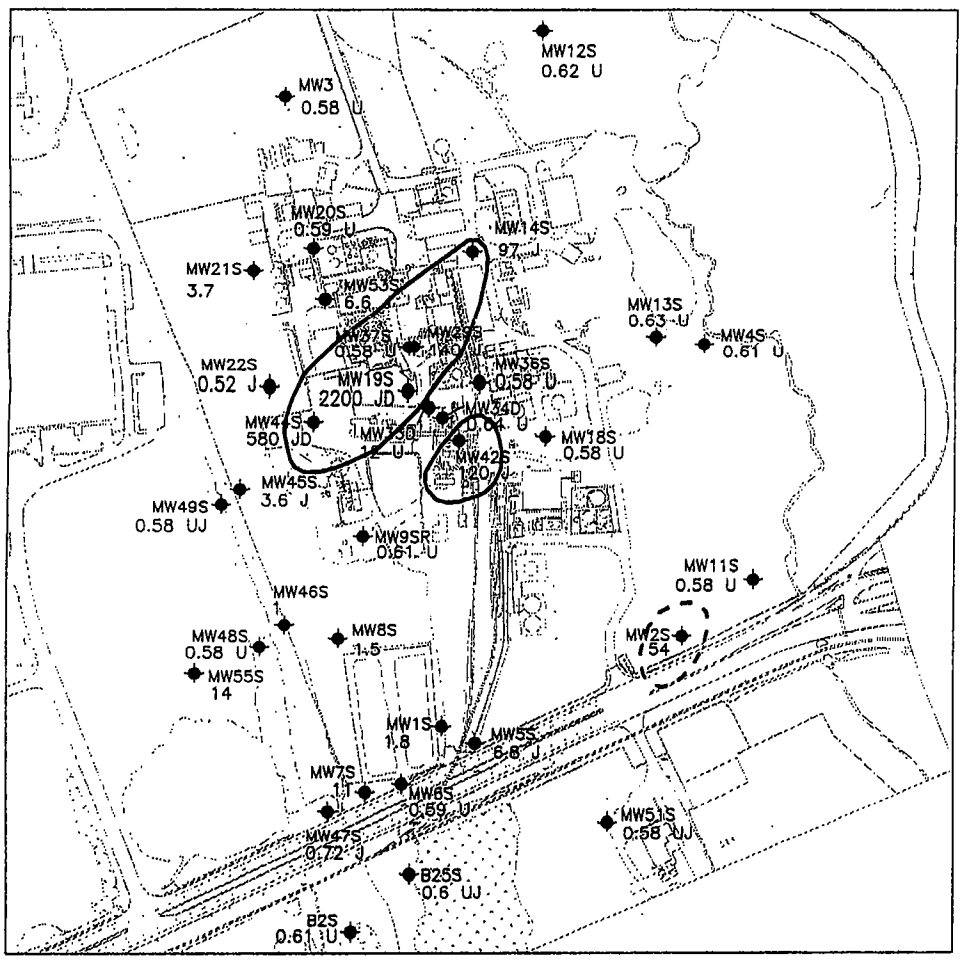
SAMPLING DATE – APRIL/MAY 1992



SAMPLING DATE – OCTOBER 1992



SAMPLING DATE – NOVEMBER 1994



SAMPLING DATE – OCTOBER/NOVEMBER 1998

LEGEND:

U = NOT DETECTED

J = ESTIMATED CONCENTRATION

30 UG/L CONCENTRATION CONTOUR (DASHED WHERE ESTIMATED)

ALL CONCENTRATIONS IN UG/L

N

NOTES:

1. NJDEP GROUNDWATER QUALITY STANDARD FOR BIS(2-ETHYLHEXYL)PHTHALATE=30 UG/L
2. WELLS MW-33D AND MW-34D ARE SCREENED IN THE SHALLOW WATER-BEARING ZONE.

0 500 1000

SCALE (FEET)

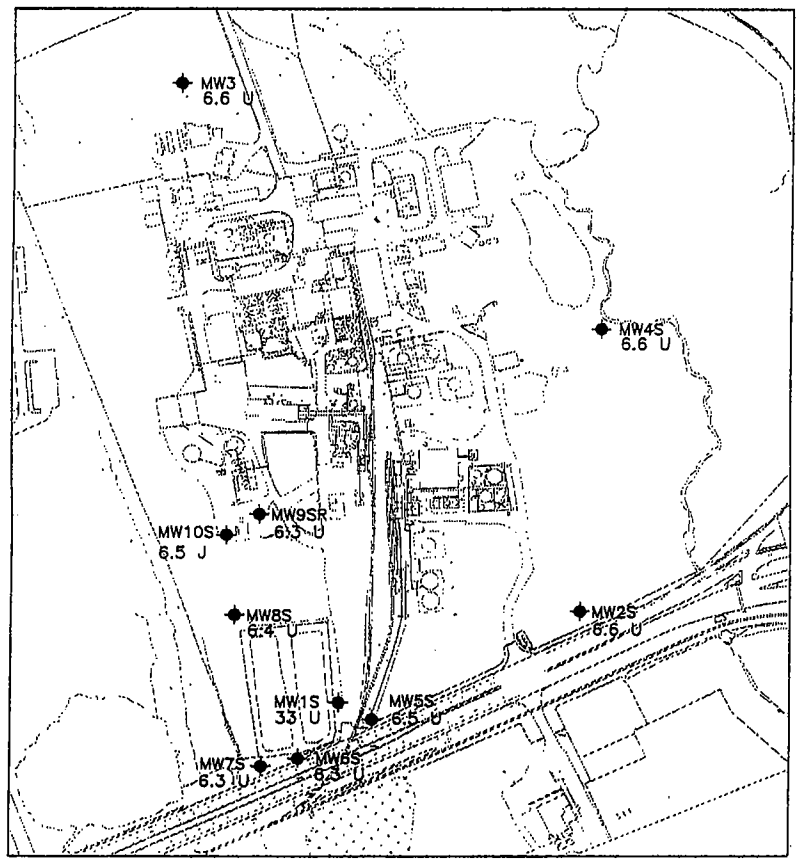
BIS(2-ETHYLHEXYL)PHTHALATE CONCENTRATIONS IN SHALLOW GROUNDWATER
SITE FEATURES MAP
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

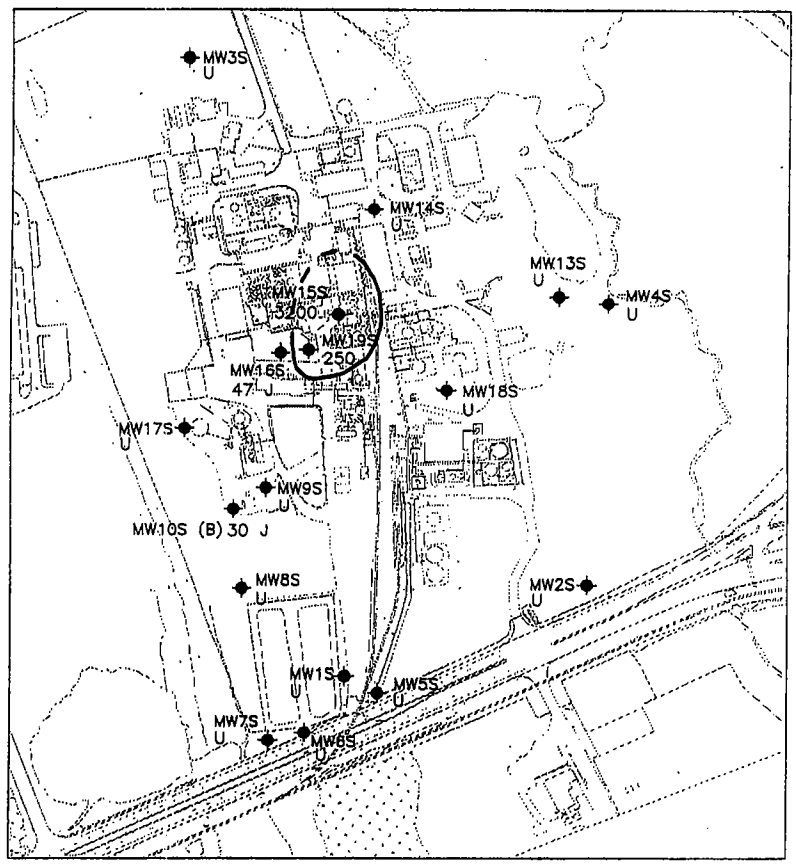
WAYNE, NEW JERSEY

DR. BY	JL	SCALE	AS SHOWN	DWG. NO. 64695114	PROJ. NO. 6E04695
CK'D. BY	RC	DATE	JAN 11, 2001	FIG. NO.	3-27

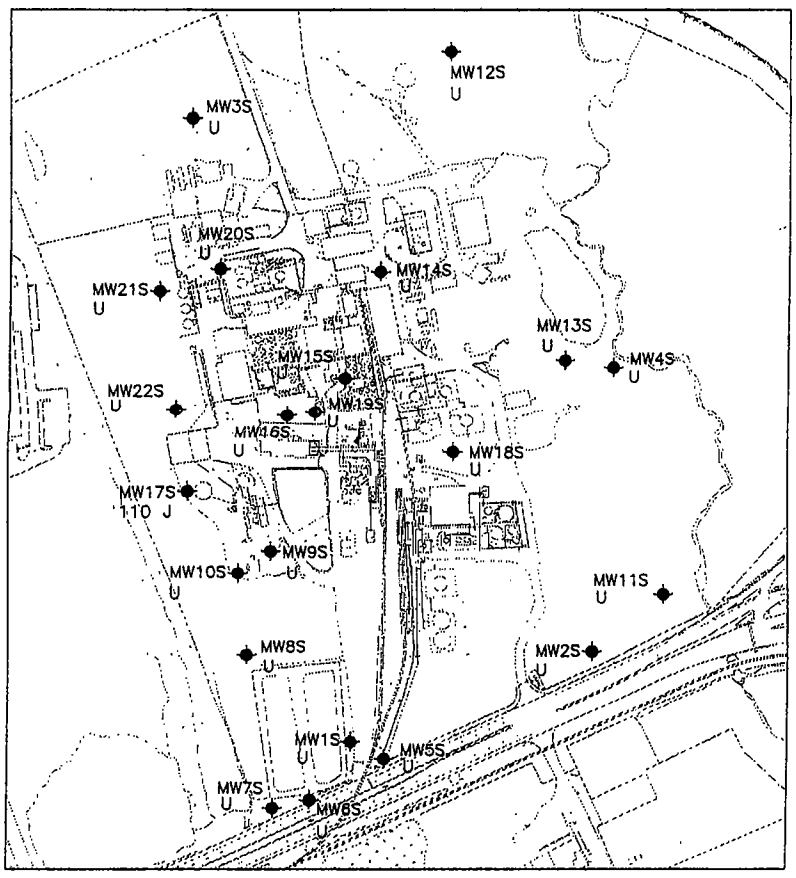
K:\ADD\6E04695\64695114.dwg, 03/23/2001 10:27:42 AM, 1:1



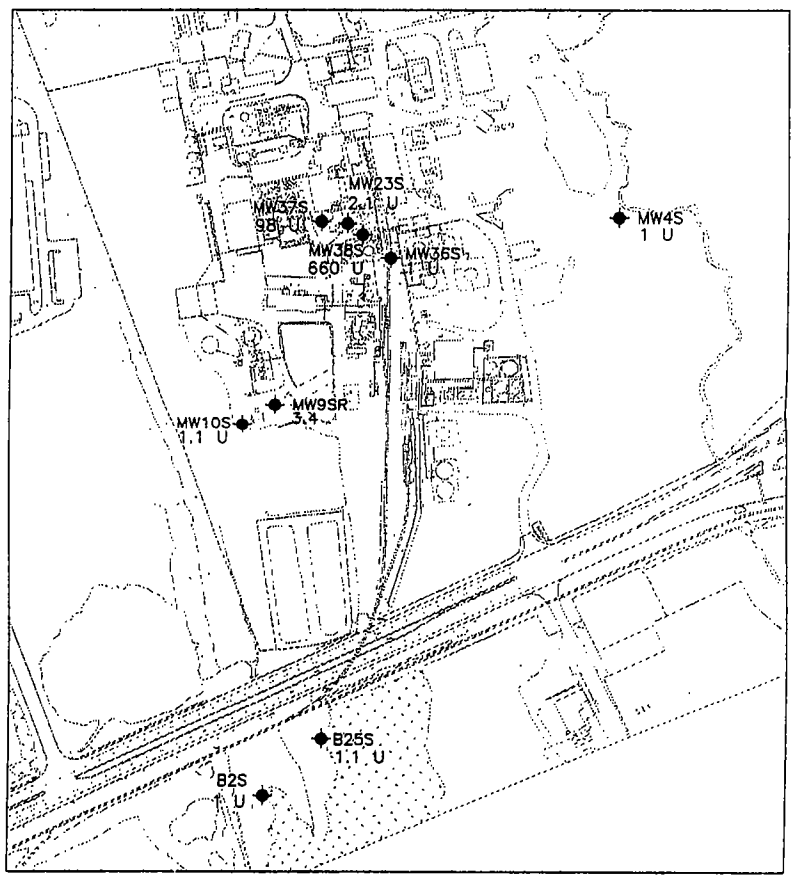
SAMPLING DATE – OCTOBER 1991



SAMPLING DATE – APRIL/MAY 1992



SAMPLING DATE – OCTOBER 1992



SAMPLING DATE – NOVEMBER 1994

SAMPLING DATE – OCTOBER/NOVEMBER 1998

N

LEGEND:

U = NOT DETECTED

J = ESTIMATED CONCENTRATION

– – 100 UG/L CONCENTRATION CONTOUR (DASHED WHERE ESTIMATED)

ALL CONCENTRATIONS IN UG/L

NOTES:

1. NJDEP GROUNDWATER QUALITY STANDARD FOR DI–N–OCTYLPHTHALATE=100 UG/L
2. WELLS MW–33D AND MW–34D ARE SCREENED IN THE SHALLOW WATER–BEARING ZONE.

0 500 1000

SCALE (FEET)

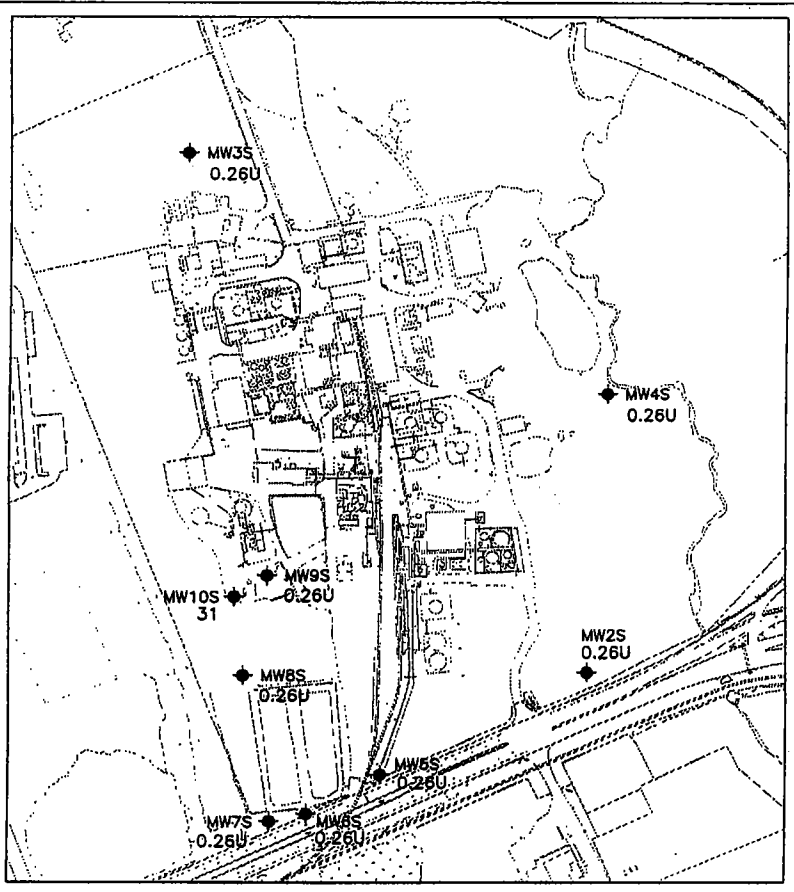
DI–N–OCTYLPHTHALATE CONCENTRATIONS IN SHALLOW GROUNDWATER HATCO CORPORATION SITE FORDS, NEW JERSEY

URS

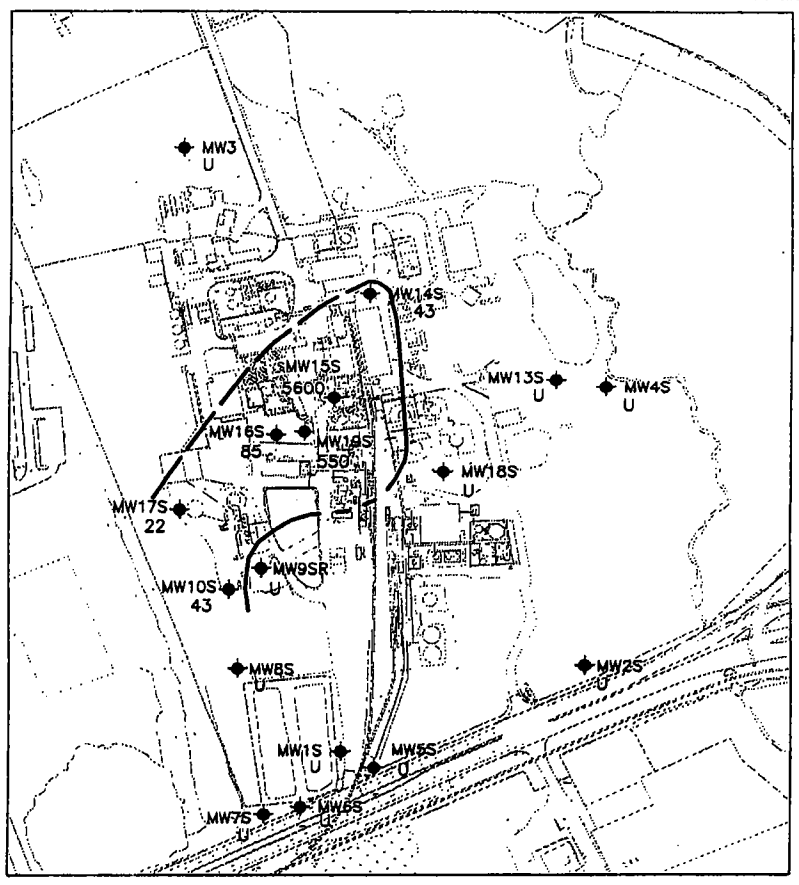
WAYNE, NEW JERSEY

DR. BY	JL	SCALE	AS SHOWN	DWG. NO. 64695117	PROJ. NO. 6E04695
CK'D. BY	RC	DATE	JAN 11, 2001	FIG. NO.	3–28

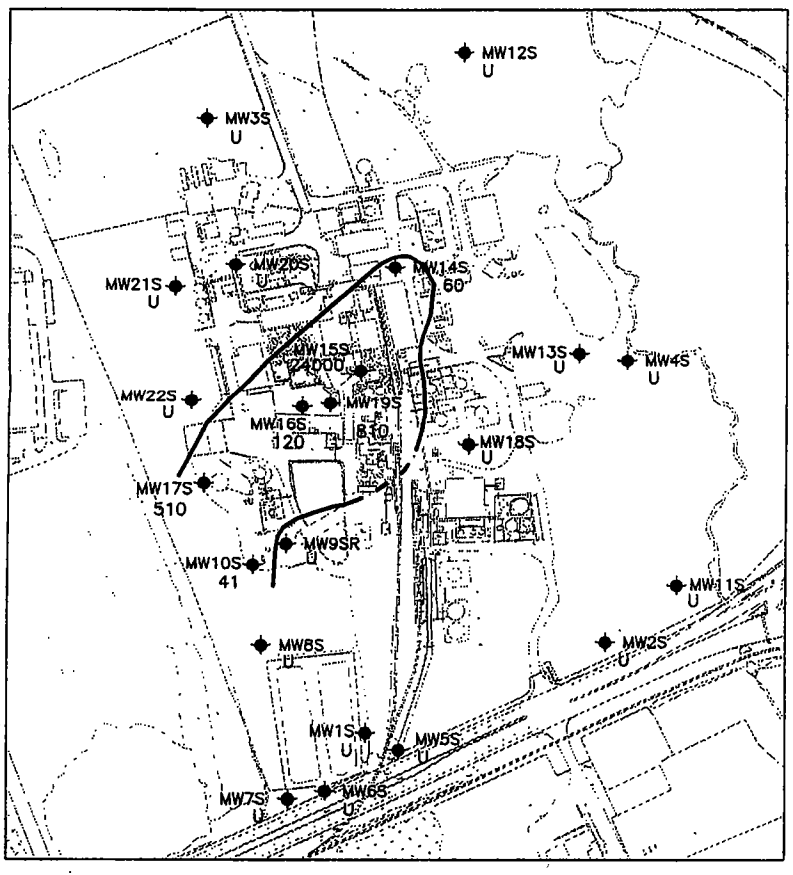
K:\ACAD\6E04695\64695117.dwg, 03/23/2001 10:28:42 AM, 1:1



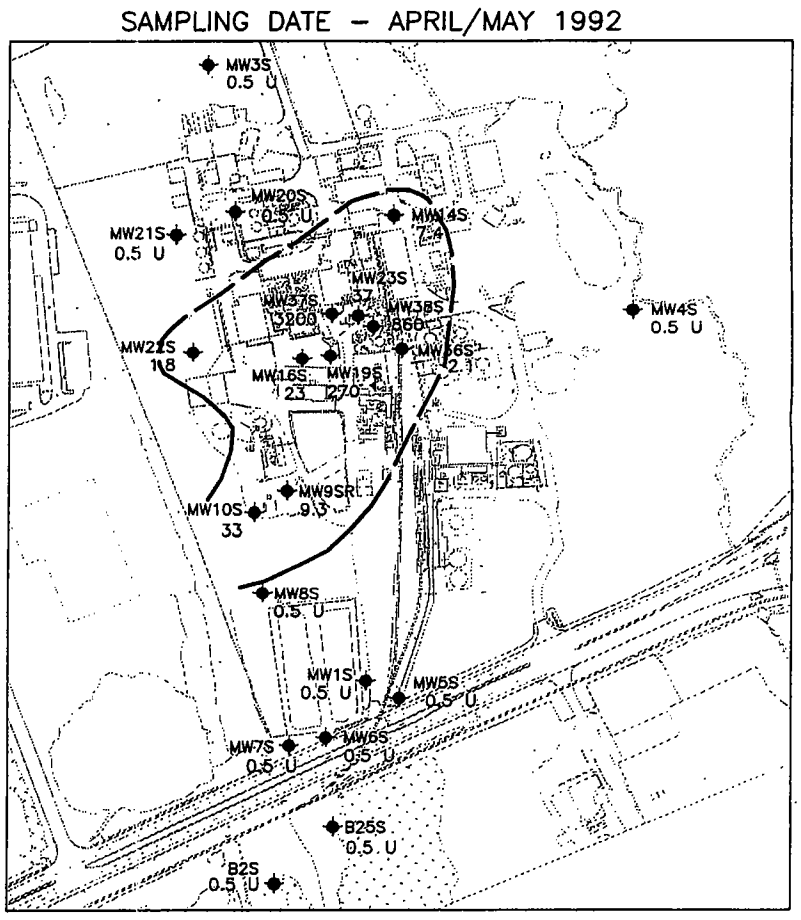
SAMPLING DATE – OCTOBER 1991



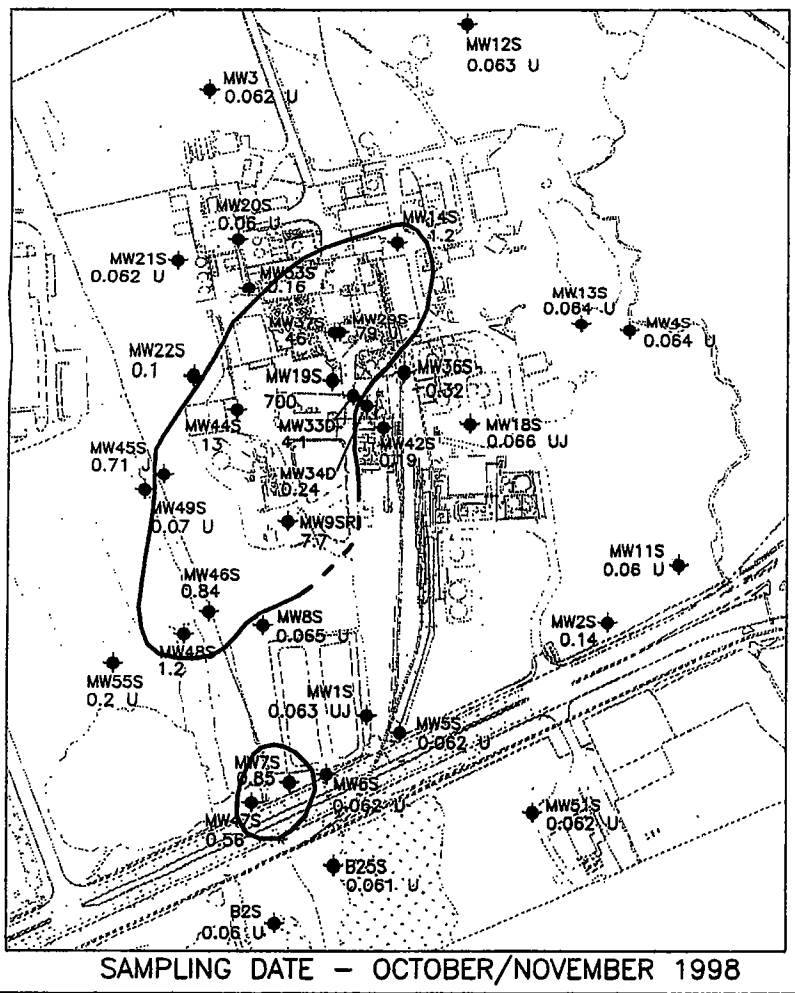
SAMPLING DATE – APRIL/MAY 1992



SAMPLING DATE – OCTOBER 1992



SAMPLING DATE – NOVEMBER 1994



SAMPLING DATE – OCTOBER/NOVEMBER 1998

N

LEGEND:

U = NOT DETECTED

J = ESTIMATED CONCENTRATION

0.5 UG/L CONCENTRATION CONTOUR (DASHED WHERE ESTIMATED)

ALL CONCENTRATIONS IN UG/L

NOTES:

1. NJDEP GROUNDWATER QUALITY STANDARD FOR TOTAL PCBs=0.5 UG/L
2. WELLS MW-33D AND MW-34D ARE SCREENED IN THE SHALLOW WATER-BEARING ZONE.

0 500 1000

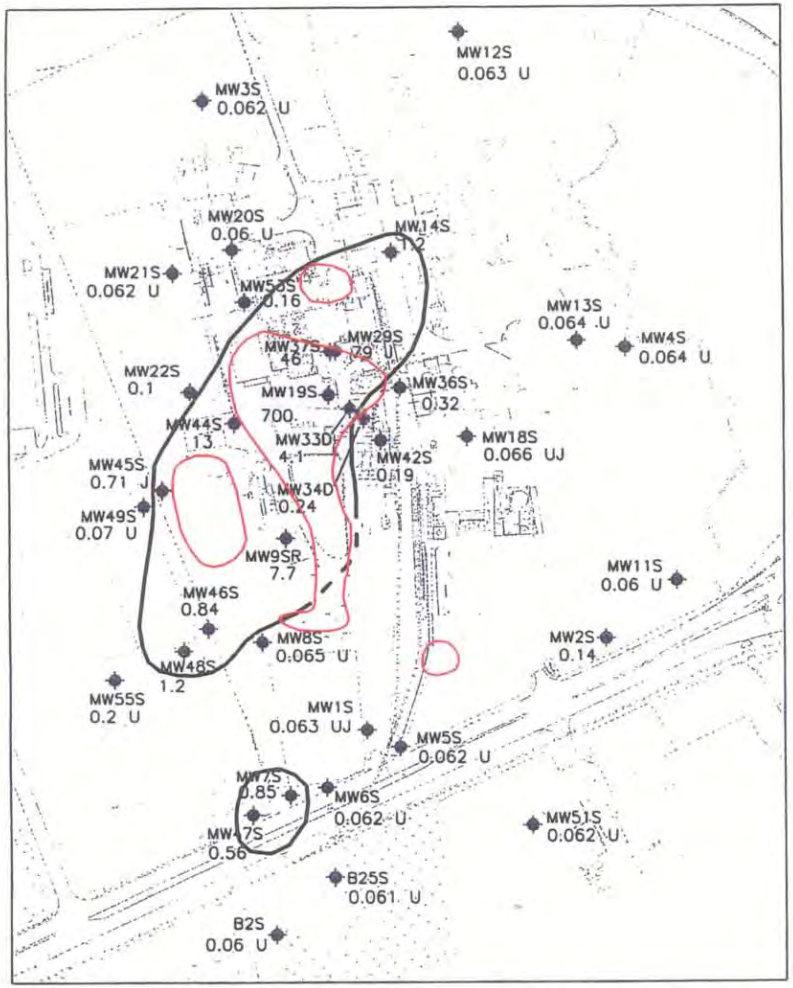
SCALE (FEET)

AROCLOR 1248 CONCENTRATIONS IN SHALLOW GROUNDWATER (UNFILTERED) SITE FEATURES MAP HATCO CORPORATION SITE FORDS, NEW JERSEY

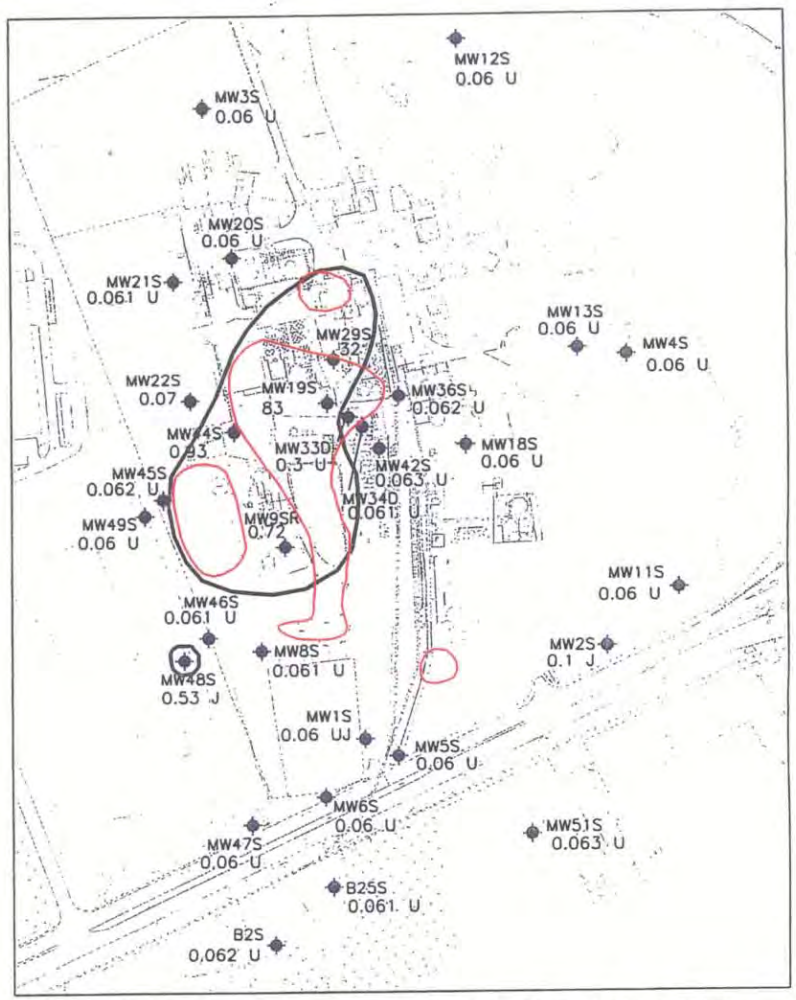
URS

WAYNE, NEW JERSEY

DR. BY	JL	SCALE	AS SHOWN	DWG. NO.	64695102	PROJ. NO.	6E04695
CK'D. BY	RC		DATE	JAN 2, 2001		FIG. NO.	3-29



SAMPLING DATE – OCTOBER/NOVEMBER 1998
PCBs – UNFILTERED



SAMPLING DATE – OCTOBER/NOVEMBER 1998
PCBs – FILTERED

N

LEGEND:

U = NOT DETECTED
J = ESTIMATED CONCENTRATION

–0.5 UG/L CONCENTRATION CONTOUR (DASHED WHERE ESTIMATED)

APPROXIMATE EXTENT OF LNAPL

ALL CONCENTRATIONS IN UG/L

NOTES:

1. NJDEP GROUNDWATER QUALITY STANDARD FOR PCBs=0.5 UG/L
2. WELLS MW–33D AND MW–34D ARE SCREENED IN THE SHALLOW WATER–BEARING ZONE.

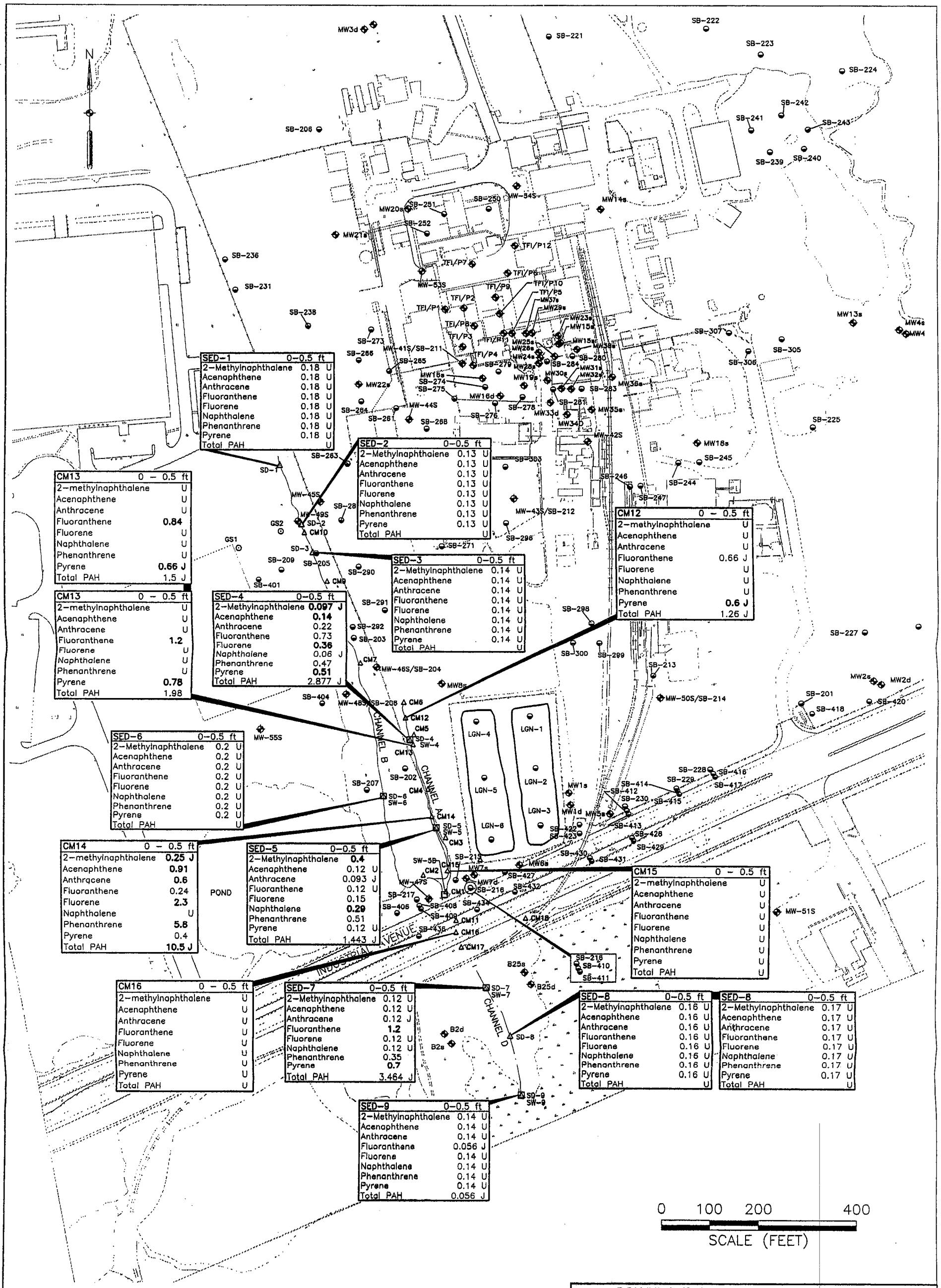
0 500 1000
SCALE (FEET)

TOTAL AND DISSOLVED CONCENTRATIONS OF AROCLOR 1248 IN SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY	JL	SCALE	AS SHOWN	DWG. NO. 64695108	PROJ. NO. 6E04695
CK'D. BY	RC	DATE	JAN 2, 2001	FIG. NO.	3–30

K:\CADD\6E04695\64695108.dwg



SED-1	0-0.5 ft	
2-Methylnaphthalene	0.18	U
Acenaphthene	0.18	U
Anthracene	0.18	U
Fluoranthene	0.18	U
Fluorene	0.18	U
Naphthalene	0.18	U
Phenanthrene	0.18	U
Pyrene	0.18	U
Total PAH		U

SED-2	0-0.5 ft	
2-Methylnaphthalene	0.13	U
Acenaphthene	0.13	U
Anthracene	0.13	U
Fluoranthene	0.13	U
Fluorene	0.13	U
Naphthalene	0.13	U
Phenanthrene	0.13	U
Pyrene	0.13	U
Total PAH		U

SED-3	0-0.5 ft	
2-Methylnaphthalene	0.14	U
Acenaphthene	0.14	U
Anthracene	0.14	U
Fluoranthene	0.14	U
Fluorene	0.14	U
Naphthalene	0.14	U
Phenanthrene	0.14	U
Pyrene	0.14	U
Total PAH		U

CM12	0 - 0.5 ft	
2-methylnaphthalene		U
Acenaphthene		U
Anthracene		U
Fluoranthene	0.66	J
Fluorene		U
Naphthalene		U
Phenanthrene		U
Pyrene	**0.6**	J
Total PAH	1.26	J

CM13	0 - 0.5 ft	
2-methylnaphthalene		U
Acenaphthene		U
Anthracene		U
Fluoranthene	**0.84**	
Fluorene		U
Naphthalene		U
Phenanthrene		U
Pyrene	**0.66**	J
Total PAH	1.5	J

CM13	0 - 0.5 ft	
2-methylnaphthalene		U
Acenaphthene		U
Anthracene		U
Fluoranthene	**1.2**	
Fluorene		U
Naphthalene		U
Phenanthrene		U
Pyrene	**0.78**	
Total PAH	1.98	

SED-4	0-0.5 ft	
2-Methylnaphthalene	**0.097**	J
Acenaphthene	**0.14**	
Anthracene	0.22	
Fluoranthene	0.73	
Fluorene	**0.36**	
Naphthalene	0.06	J
Phenanthrene	0.47	
Pyrene	**0.51**	
Total PAH	2.877	J

SED-6	0-0.5 ft	
2-Methylnaphthalene	0.2	U
Acenaphthene	0.2	U
Anthracene	0.2	U
Fluoranthene	0.2	U
Fluorene	0.2	U
Naphthalene	0.2	U
Phenanthrene	0.2	U
Pyrene	0.2	U
Total PAH		U

CM14	0 - 0.5 ft	
2-methylnaphthalene	**0.25**	J
Acenaphthene	**0.91**	
Anthracene	**0.6**	
Fluoranthene	0.24	
Fluorene	**2.3**	
Naphthalene		U
Phenanthrene	**5.8**	
Pyrene	0.4	
Total PAH	**10.5**	J

SED-5	0-0.5 ft	
2-Methylnaphthalene	**0.4**	
Acenaphthene	0.12	U
Anthracene	0.093	J
Fluoranthene	0.12	U
Fluorene	0.15	
Naphthalene	**0.29**	
Phenanthrene	0.51	
Pyrene	0.12	U
Total PAH	1.443	J

CM15	0 - 0.5 ft	
2-methylnaphthalene		U
Acenaphthene		U
Anthracene		U
Fluoranthene		U
Fluorene		U
Naphthalene		U
Phenanthrene		U
Pyrene		U
Total PAH		U

CM16	0 - 0.5 ft	
2-methylnaphthalene		U
Acenaphthene		U
Anthracene		U
Fluoranthene		U
Fluorene		U
Naphthalene		U
Phenanthrene		U
Pyrene		U
Total PAH		U

SED-7	0-0.5 ft	
2-Methylnaphthalene	0.12	U
Acenaphthene	0.12	U
Anthracene	0.12	J
Fluoranthene	**1.2**	
Fluorene	0.12	U
Naphthalene	0.12	U
Phenanthrene	0.35	
Pyrene	**0.7**	
Total PAH	3.464	J

SED-8	0-0.5 ft	
2-Methylnaphthalene	0.16	U
Acenaphthene	0.16	U
Anthracene	0.16	U
Fluoranthene	0.16	U
Fluorene	0.16	U
Naphthalene	0.16	U
Phenanthrene	0.16	U
Pyrene	0.16	U
Total PAH		U

SED-8	0-0.5 ft	
2-Methylnaphthalene	0.17	U
Acenaphthene	0.17	U
Anthracene	0.17	U
Fluoranthene	0.17	U
Fluorene	0.17	U
Naphthalene	0.17	U
Phenanthrene	0.17	U
Pyrene	0.17	U
Total PAH		U

SED-9	0-0.5 ft	
2-Methylnaphthalene	0.14	U
Acenaphthene	0.14	U
Anthracene	0.14	U
Fluoranthene	0.056	J
Fluorene	0.14	U
Naphthalene	0.14	U
Phenanthrene	0.14	U
Pyrene	0.14	U
Total PAH	0.056	J

NOTES:
J = Concentration is an estimated value
U = Compound was not detected
Bold values exceed NJDEP Lowest Effects Level, Guidance for Sediment Quality Evaluations, November 1998

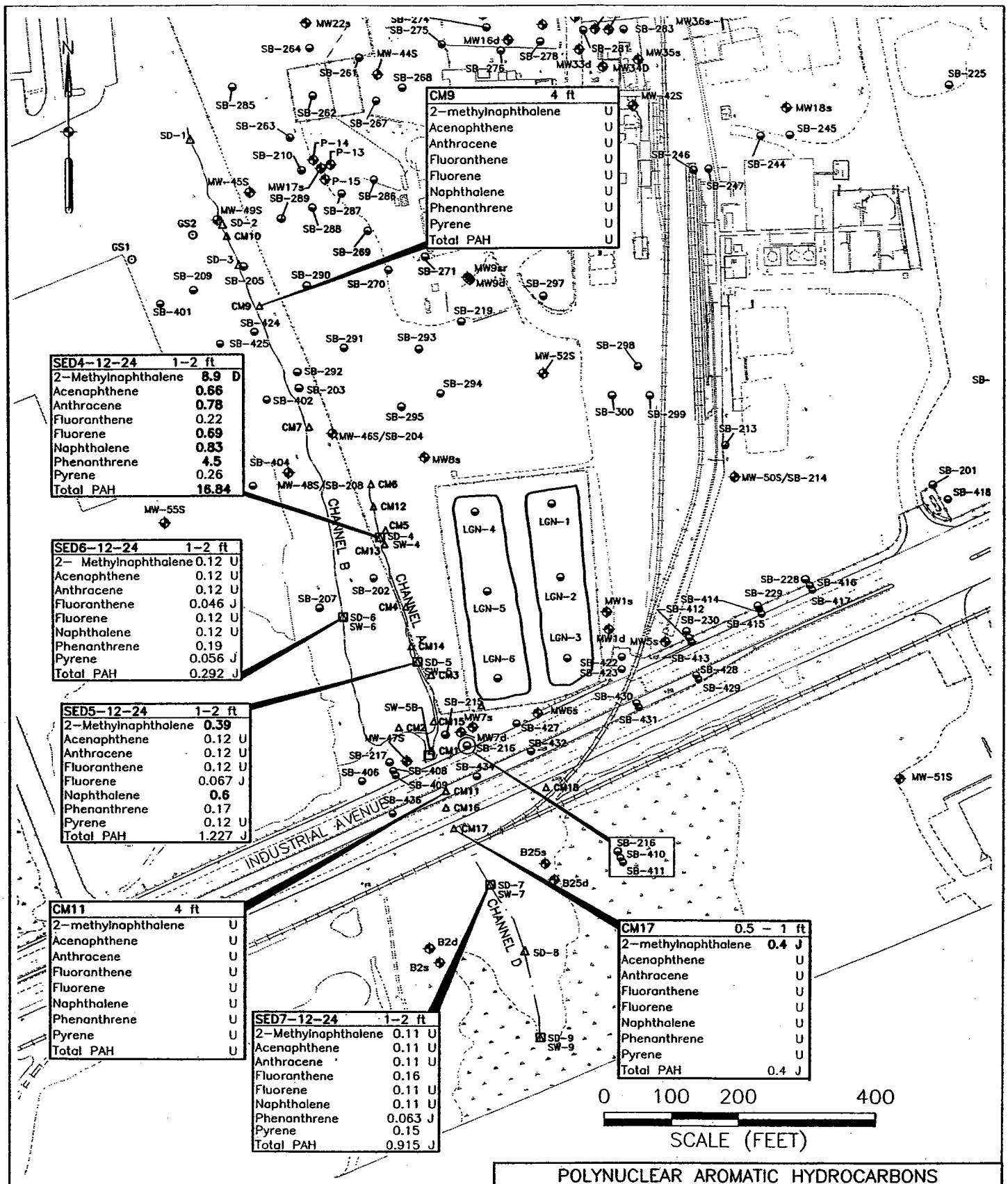
All concentrations in mg/kg

POLYNUCLEAR AROMATIC HYDROCARBONS (PAHs) IN SEDIMENT SAMPLES (0-0.5 FT) HATCO CORPORATION SITE FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY	ET	SCALE	AS SHOWN	DWG. NO. 6469125	PROJ. NO. 6E04695
CK'D. BY	MEC	DATE	JAN. 19, 2001	FIG. NO.	3-31

C:\ADD\6E04695\6469125.dwg, 03/23/2001 03:55:18 PM, 1:1



NOTES:
J = Concentration is an estimated value
U = Compound was not detected
Bold values exceed NJDEP Lowest Effects Level, Guidance for Sediment Quality Evaluations, November 1998

All concentrations in mg/kg

POLYNUCLEAR AROMATIC HYDROCARBONS (PAHs) IN SEDIMENT SAMPLES (>0.5 FT) HATCO CORPORATION SITE FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY	ET	SCALE	AS SHOWN	DWG. NO. 6469126	PROJ. NO. 6E04695
CK'D. BY	MEC	DATE	JAN. 19, 2001	FIG. NO.	3-32

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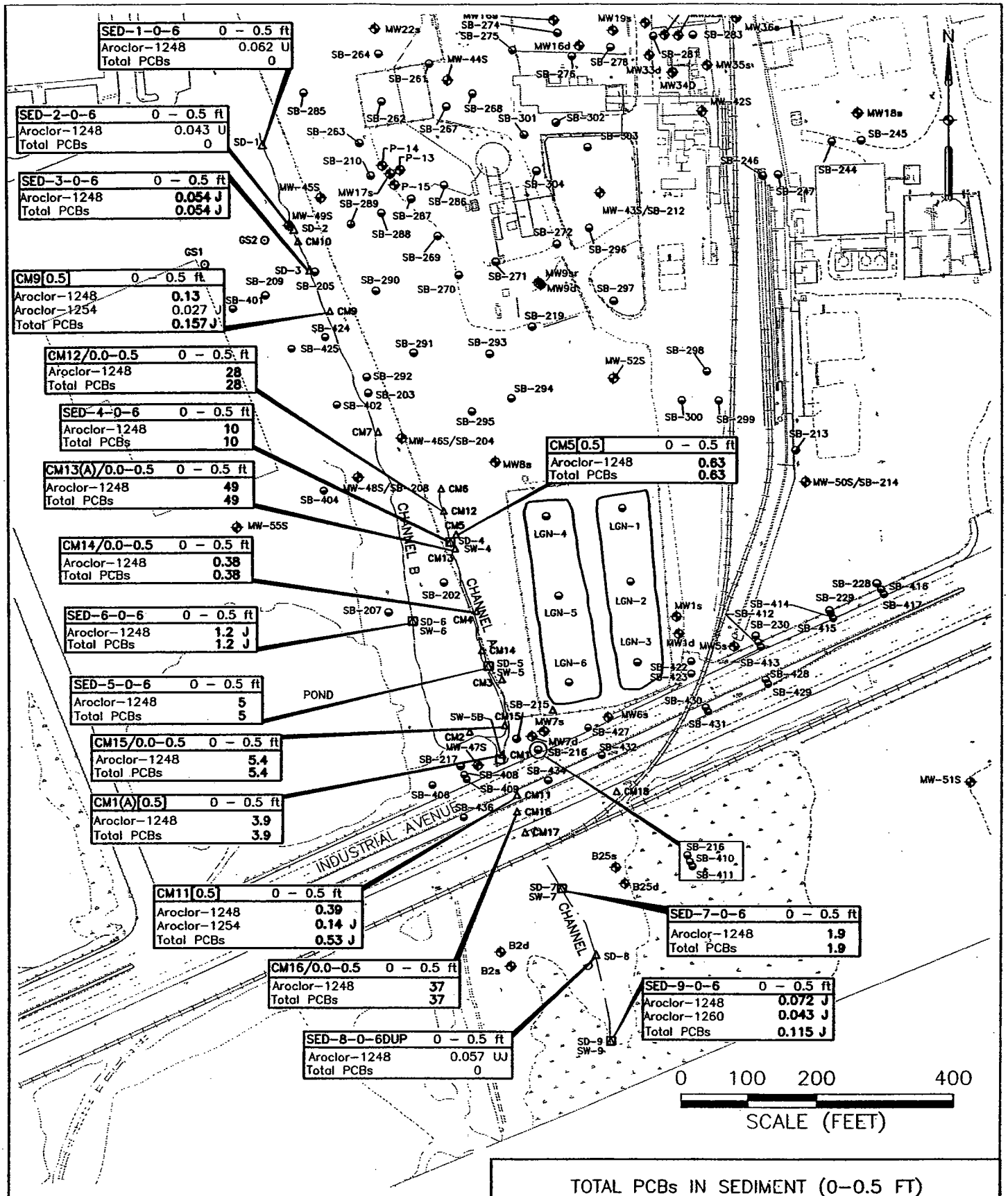

NOTES:
J = Concentration is an estimated value
U = Compound was not detected
Bold values exceed NJDEP Lowest Effects Level, Guidance for Sediment Quality Evaluations, November 1998

All concentrations in mg/kg

TOTAL PCBs IN SEDIMENT (0-0.5 FT)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY	ET	SCALE	AS SHOWN	DWG. NO. 6469127	PROJ. NO. 6ED4695
CK'D. BY	MEC	DATE	JAN. 19, 2001	FIG. NO.	3-33

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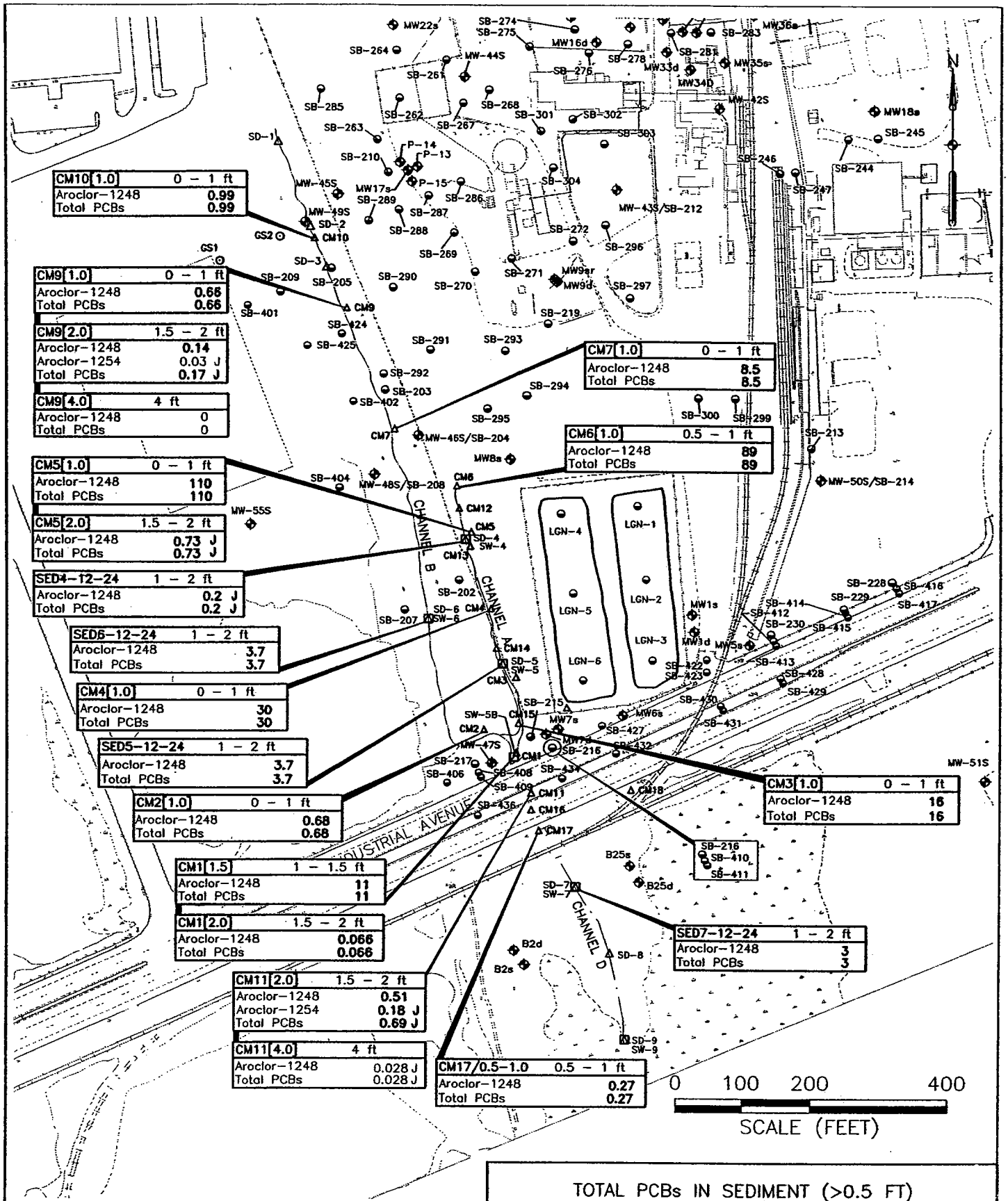

NOTES:
J = Concentration is an estimated value
U = Compound was not detected
Bold values exceed NJDEP Lowest Effects Level, Guidance for Sediment Quality Evaluations, November 1998

All concentrations in mg/kg

TOTAL PCBs IN SEDIMENT (>0.5 FT)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY	ET	SCALE	AS SHOWN	DWG. NO. 6469128	PROJ. NO. 6E04695
CK'D. BY	MEC	DATE	JAN. 19, 2001	FIG. NO.	3–34

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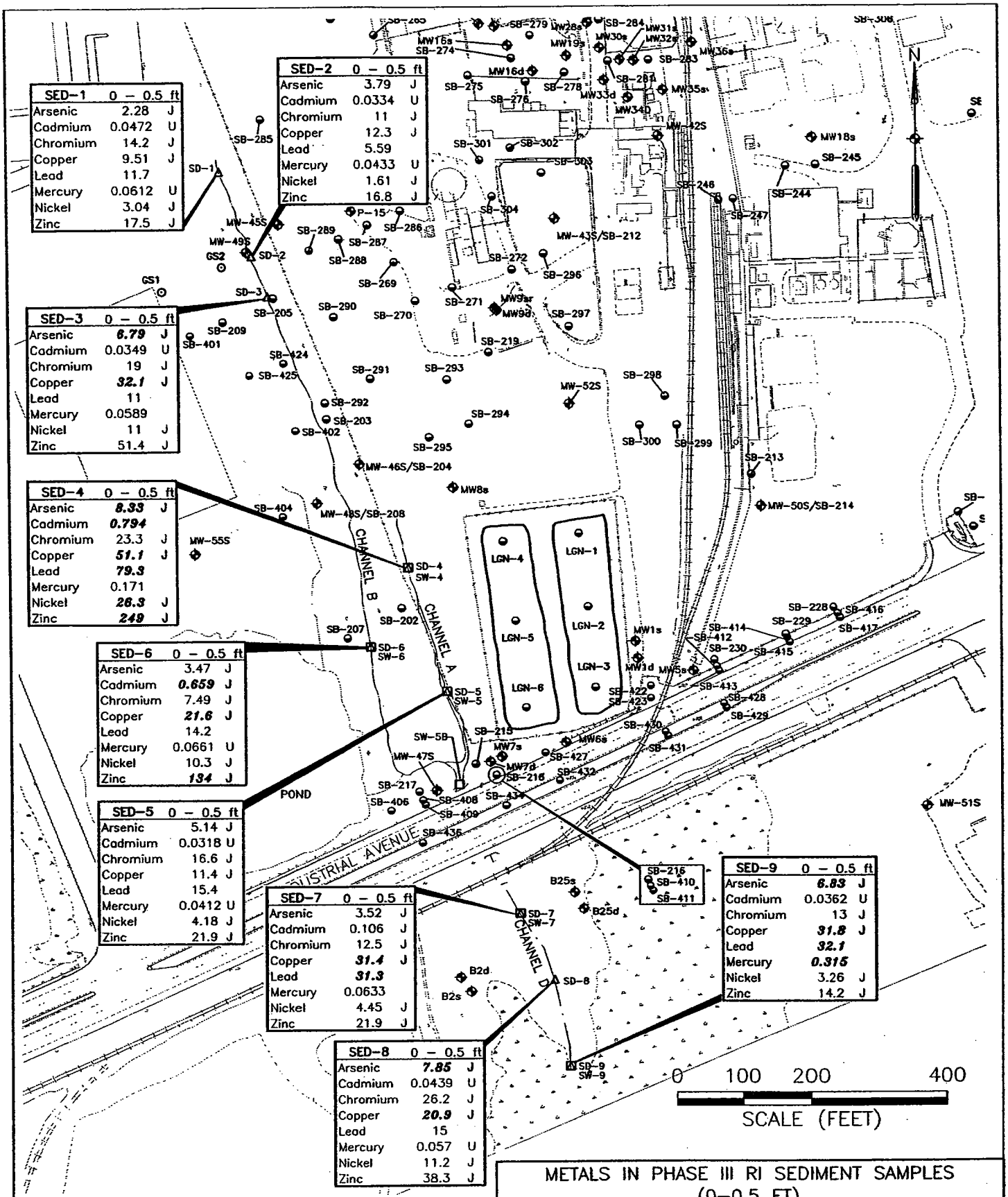

NOTES:
J = Concentration is an estimated value
U = Compound was not detected
Values in italics exceed NJDEP Lowest Effects Level, Guidance For Sediment Quality Evaluations, November 1998

All concentrations in mg/kg

METALS IN PHASE III RI SEDIMENT SAMPLES (0–0.5 FT)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY	ET	SCALE	AS SHOWN	DWG. NO. 6469121	PROJ. NO. 6E04695
CK'D. BY	MEC	DATE	JAN. 22, 2001	FIG. NO.	3-35

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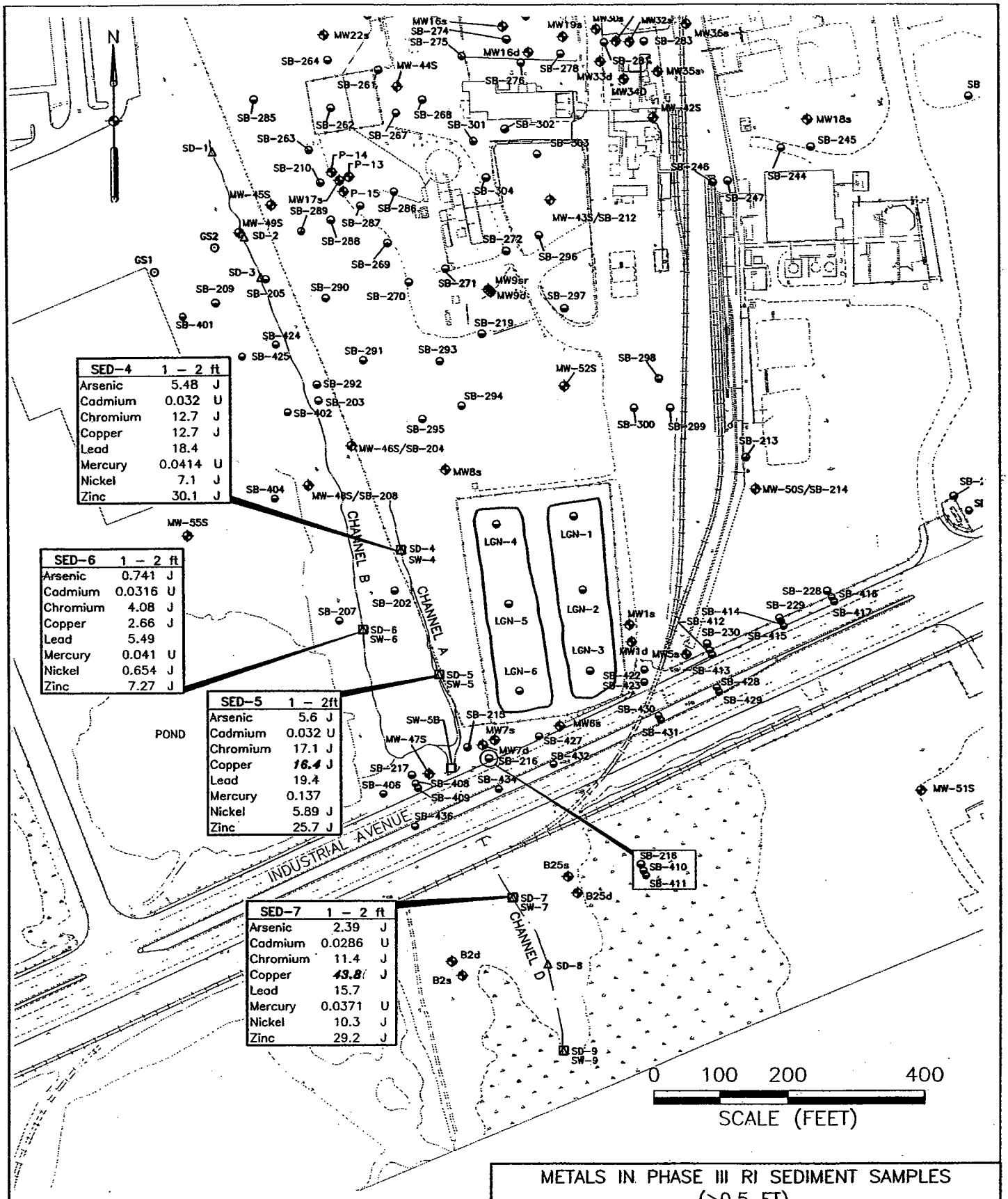


NOTES:
J = Concentration is an estimated value
U = Compound was not detected
Values in italics exceed NJDEP Lowest Effects Level, Guidance For Sediment Quality Evaluations, November 1998

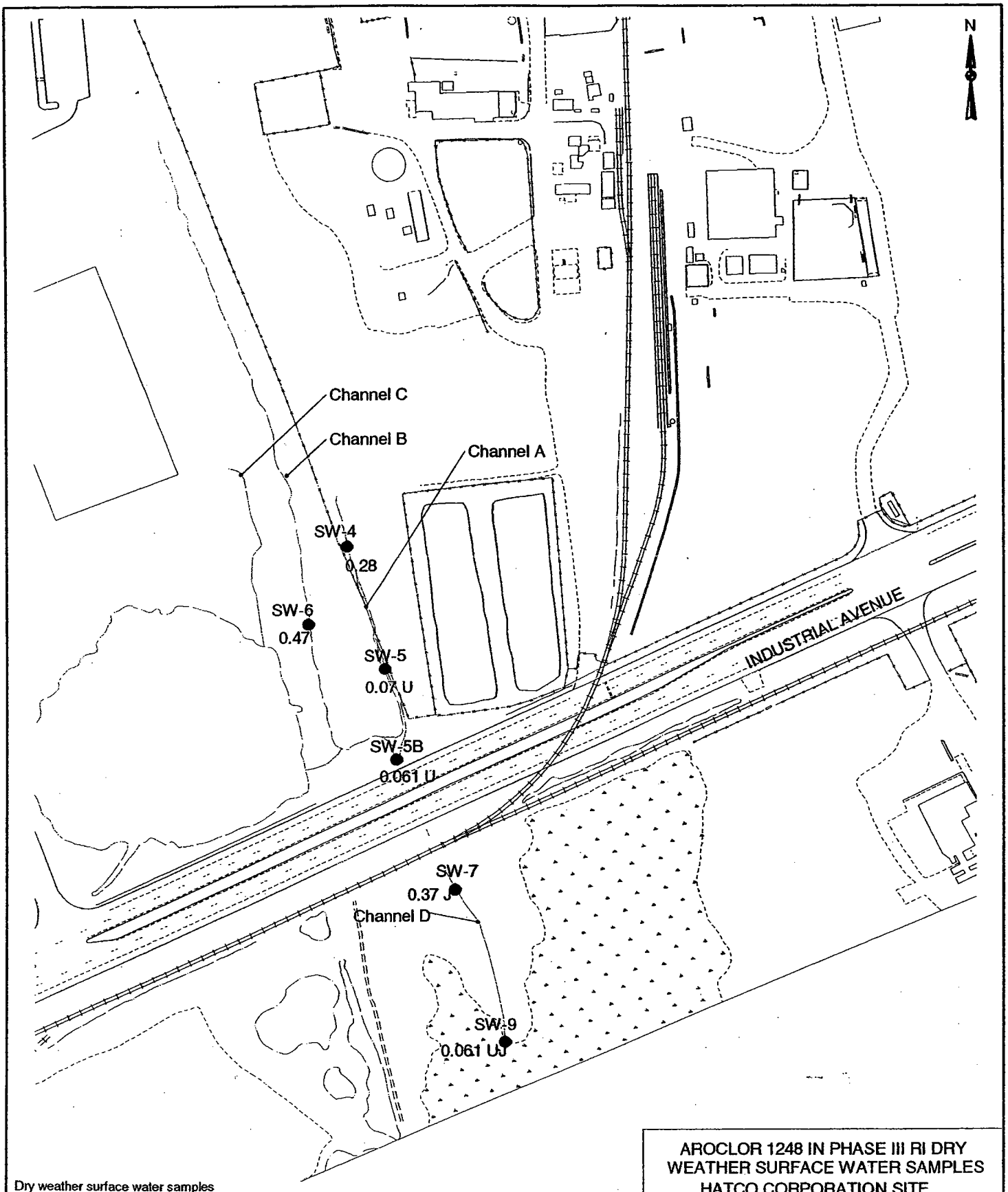
All concentrations in mg/kg

METALS IN PHASE III RI SEDIMENT SAMPLES
(>0.5 FT)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY	ET	SCALE	AS SHOWN	DWG. NO. 6469122	PROJ. NO. 6E04695
CK'D. BY	MEC	DATE	JAN. 22, 2001	FIG. NO.	3-36

K:\CADD\6E04695\64695122.dwg, 03/23/2001 04:58:31 PM, 1:1



Dry weather surface water samples collected on December 17, 1998.

All concentrations in ug/L

Qualifier:
J = Concentration is an estimated value
U = Compound was not detected

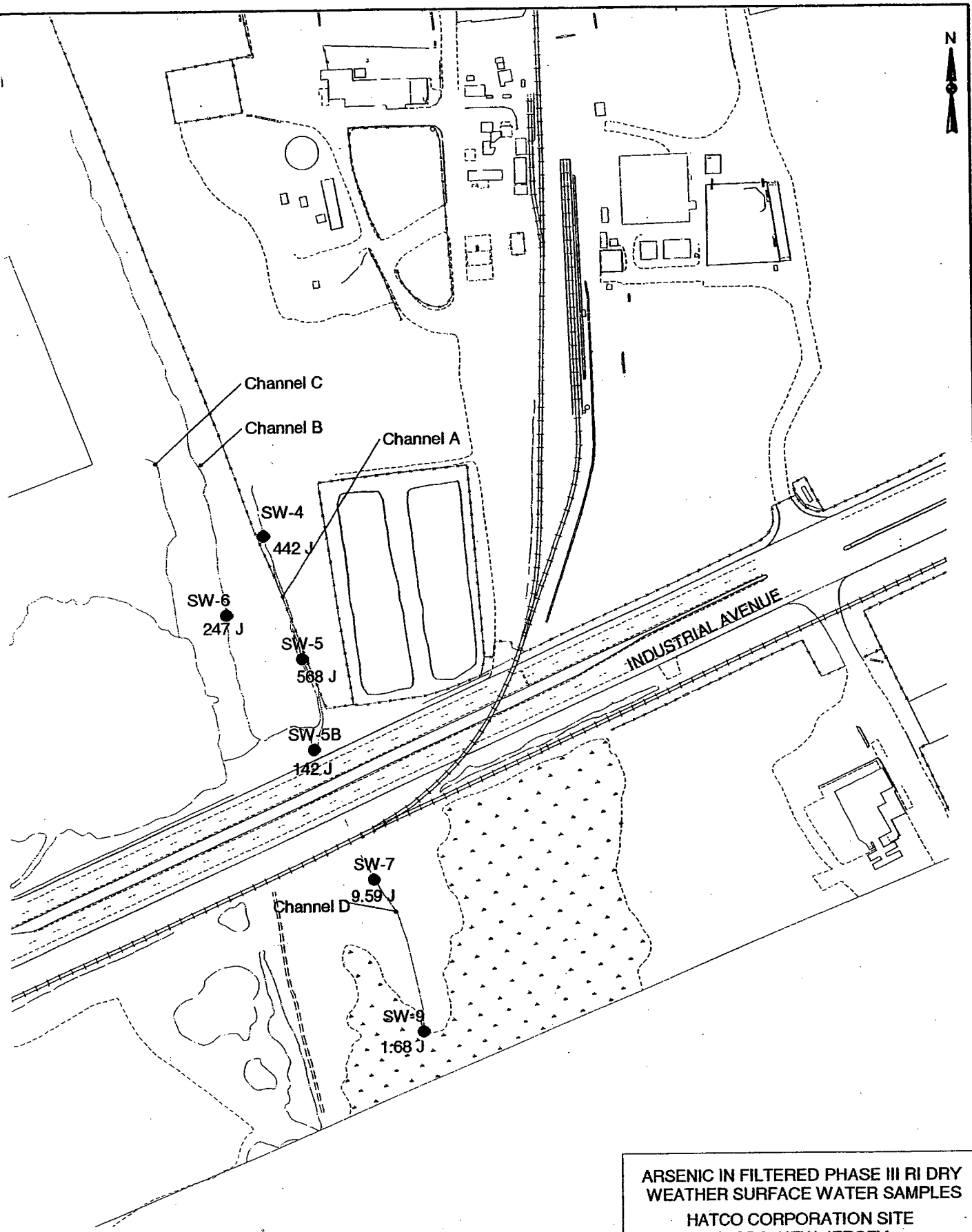
200 0 200 Feet

AROCLOR 1248 IN PHASE III RI DRY WEATHER SURFACE WATER SAMPLES
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY.

DR. BY RC	SCALE 1" = 200'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. 3-37



Dry weather surface water samples collected on December 17, 1998.

All concentrations in ug/L

Qualifier:
J = Concentration is an estimated value
U = Compound was not detected

200 0 200 Feet

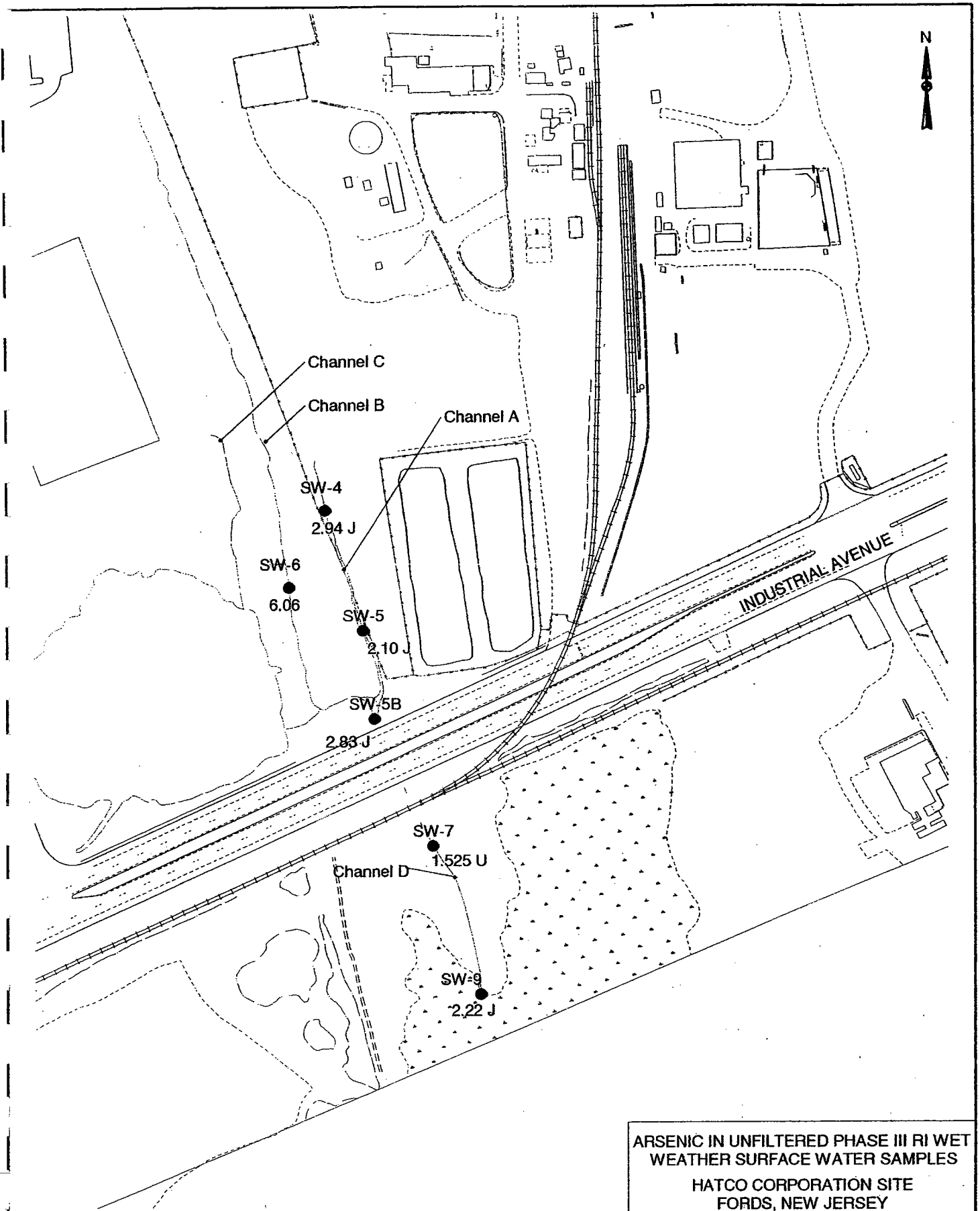
ARSENIC IN FILTERED PHASE III RI DRY WEATHER SURFACE WATER SAMPLES

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 200'	DWG. NO.	PROJECT NO. 6E04695
CKD. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. 3-38



ARSENIC IN UNFILTERED PHASE III RI WET WEATHER SURFACE WATER SAMPLES

HATCO CORPORATION SITE
FORDS, NEW JERSEY

Wet weather surface water samples collected on May 20, 1999.

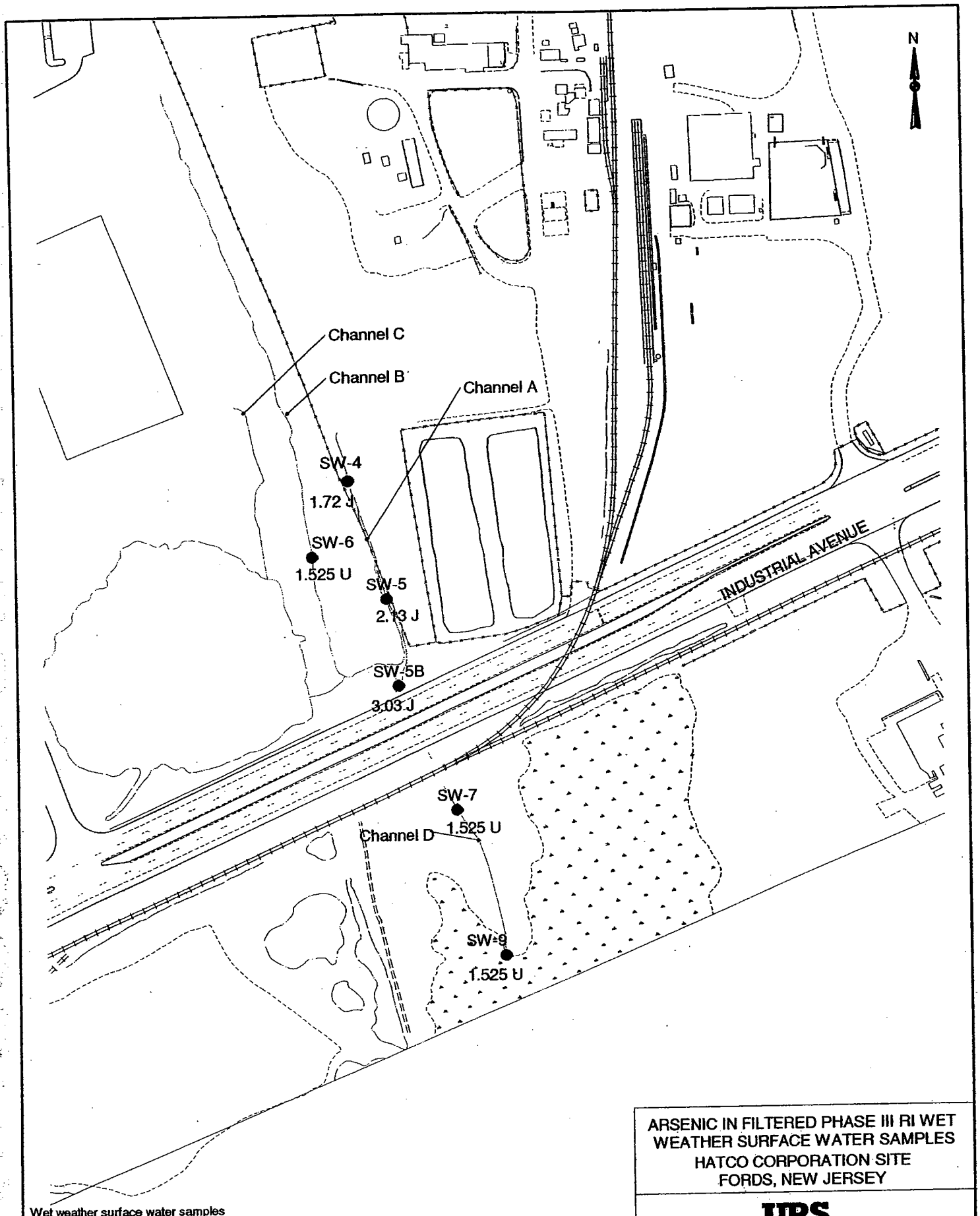
All concentrations in ug/L

Qualifier:
J = Concentration is an estimated value
U = Compound was not detected

200 0 200 Feet

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 200'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. 3-39



Wet weather surface water samples collected on May 20, 1999.

All concentrations in ug/L.

Qualifier:
J = Concentration is an estimated value
U = Compound was not detected

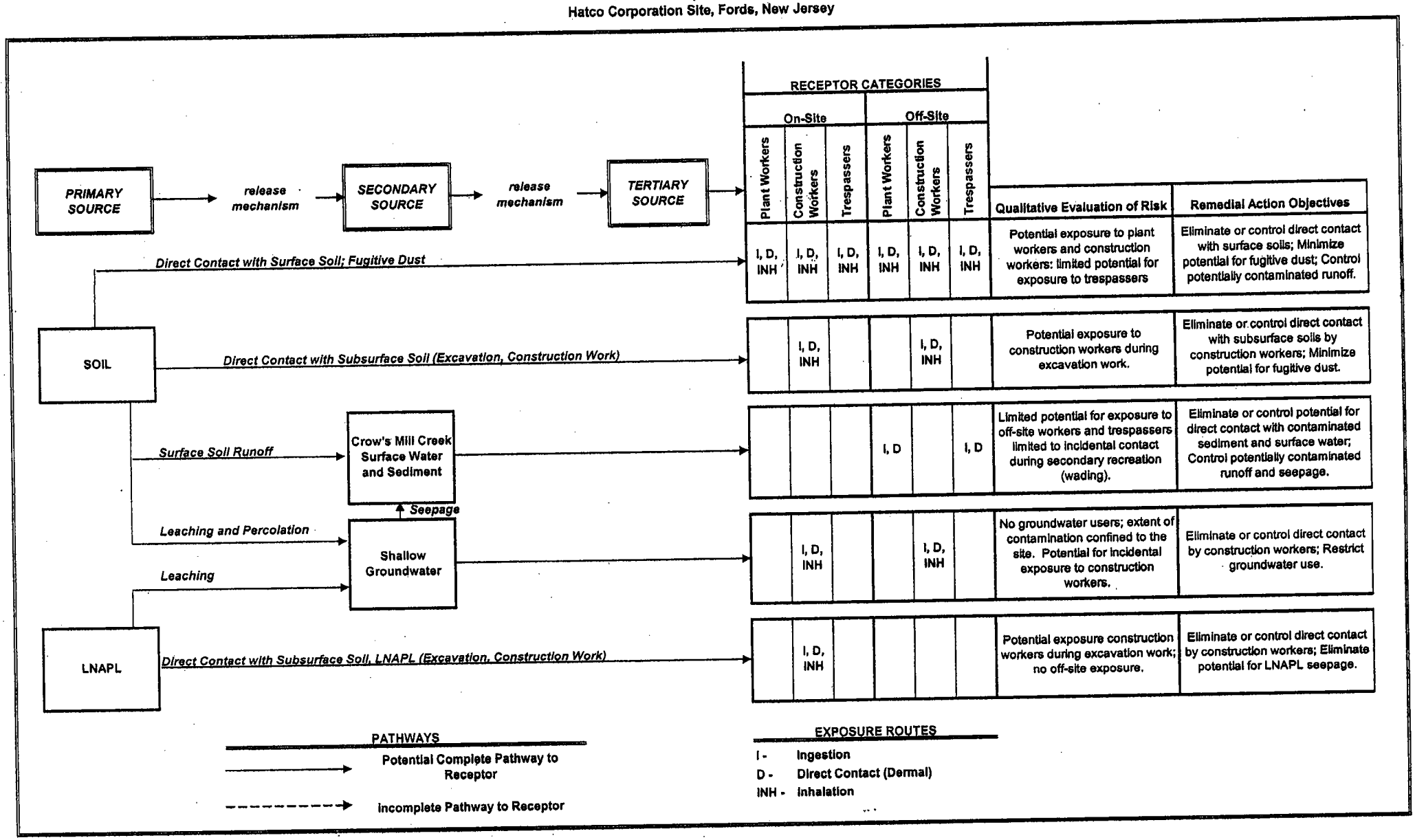
200 0 200 Feet

ARSENIC IN FILTERED PHASE III RI WET WEATHER SURFACE WATER SAMPLES
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 200'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. 3-40

Figure 3-41
Site Conceptual Exposure Model
Human Receptor Evaluation
Hatco Corporation Site, Fords, New Jersey



HHRA RISK-BASED REMEDY APPLICATION FOR HATCO SITE FORDS, NEW JERSEY SUBMITTED TO U.S. EPA REGION II

FIGURE: 4-2

PROPOSED EXTENT OF ENGINEERING CONTROL AND SOIL/SEDIMENT EXCAVATION AREAS ADDENDUM TO DRAFT RAWP

DATE: 11-15-04

N

Legend

- Soil or Sediment Sample >= 500 ppm PCBs
- Soil or Sediment Sample >= 2 and <500 ppm PCBs
- Soil or Sediment Sample < 2 ppm PCBs
- Approximate Extent of Soil or Sediment Excavation Areas with PCBs >500 ppm
- Approximate Extent of Engineering Control Defined by Soil or Sediment with PCBs >2 ppm
- Property Boundary
- Approximate Extent of Removal of Sediment and Chemical Waste above the Clay Liner of the Two On-site Lagoons

NOTE:
1. This map was created using data from URS and Dan Raviv. The background is from Geod Corp.,and mapped by photogrammetric methods from aerial photographs dated 4/10/97. Projection: NJ State Plane, NAD83.
2. The extent of engineering control and soil/sediment excavation areas are subject to change based on field verification of PCB extent in soil.

PROJECT MANAGER:	D. KOPCOW
DRAWN BY:	H. CARSON

0 50 100 200 300 Feet

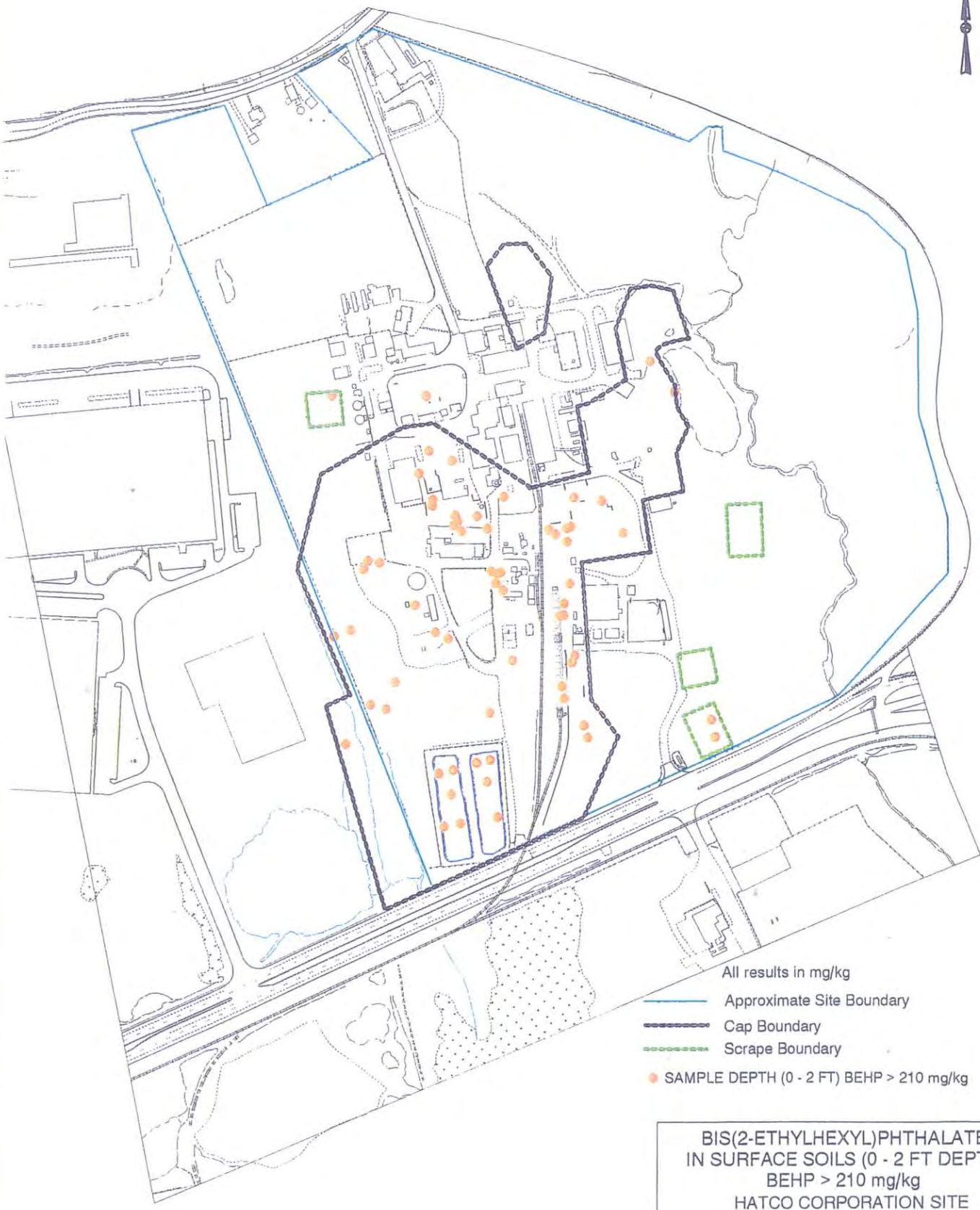
MAP SCALE

WESTON SOLUTIONS

205 Campus Drive
Edison, New Jersey 08837

Phone: (732) 417-5800
Fax: (732)417-5801

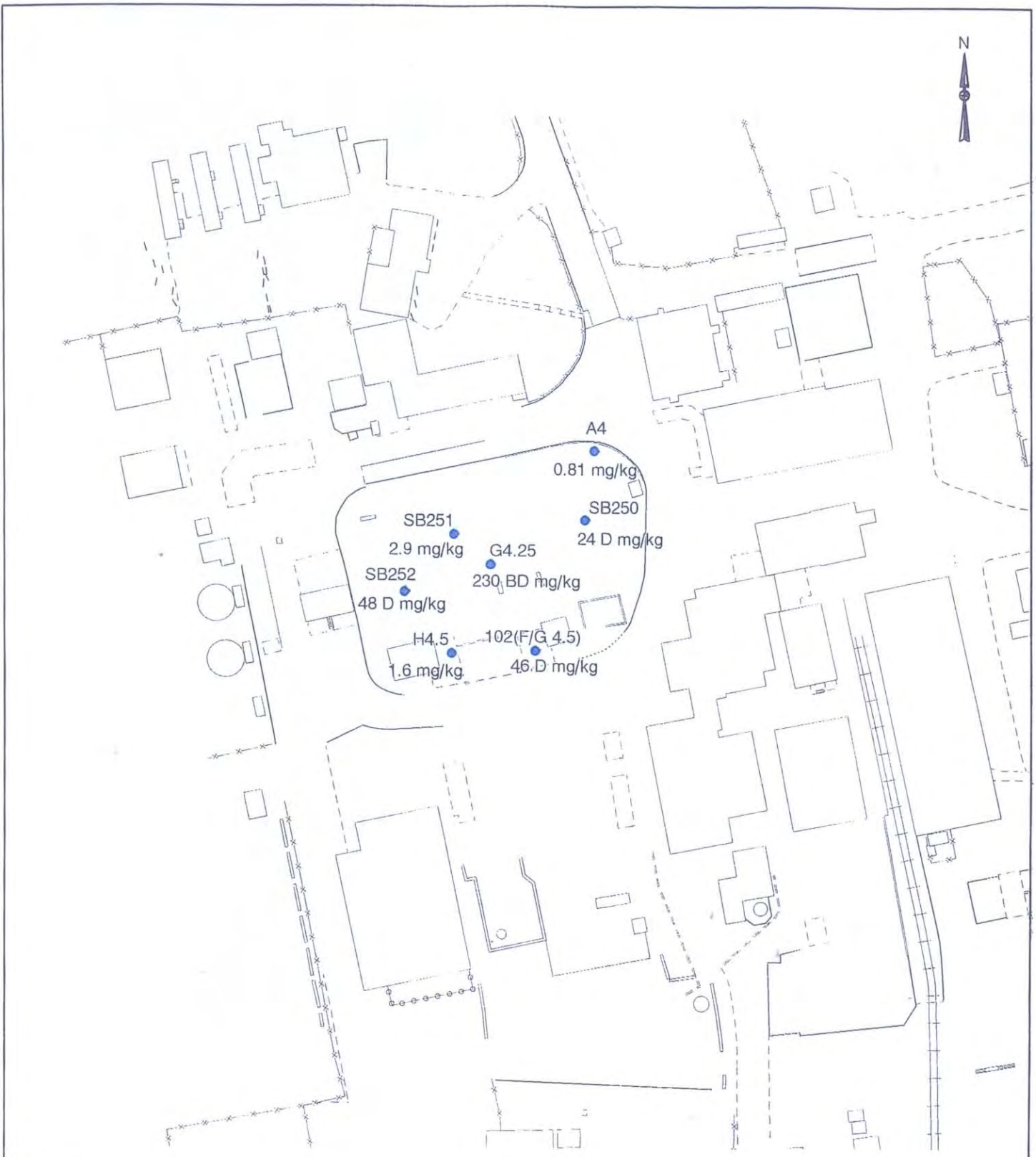
L:\Hatco Remediation\6.5 Maps, Figures & Drawings\GIS\MXDs\012308capardecav.mxd



BIS(2-ETHYLHEXYL)PHTHALATE
IN SURFACE SOILS (0 - 2 FT DEPTH)
BEHP > 210 mg/kg
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 4-3



Qualifiers:
U= Not detected
J = Estimated
D= Diluted
B = Analyte Detected in Method Blank

NJDEP BEHP Residential Direct Contact Criterion = 49 mg/kg

NJDEP BEHP Non-Residential Direct Contact Criterion = 210 mg/kg

NJDEP BEHP Impact to Groundwater Criterion = 100 mg/kg

100 0 100 Feet

BIS(2-ETHYLHEXYL)PHTHALATE (BEHP)
IN SURFACE SOIL (0 - 0.5 FT DEPTH)
ALCOHOL TANK FARM
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 100'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY GRJ	DATE: NOVEMBER 27, 2000		FIG. NO. 4-4

NAPHTHALENE IN SOILS ABOVE NJDEP CRITERIA

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. 4 - 5

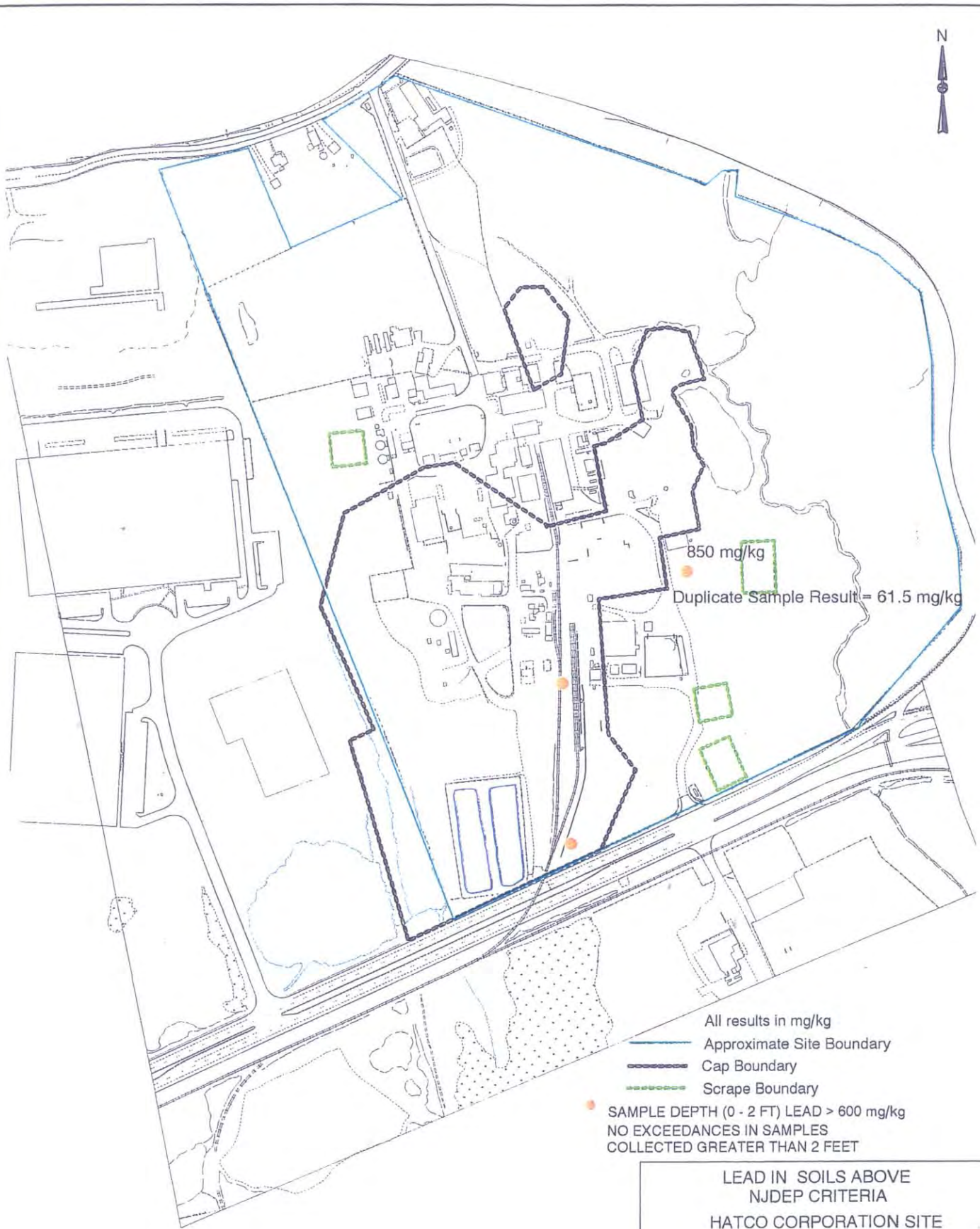
ARSENIC IN SOILS ABOVE
NJDEP CRITERIA

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. 4 - 6



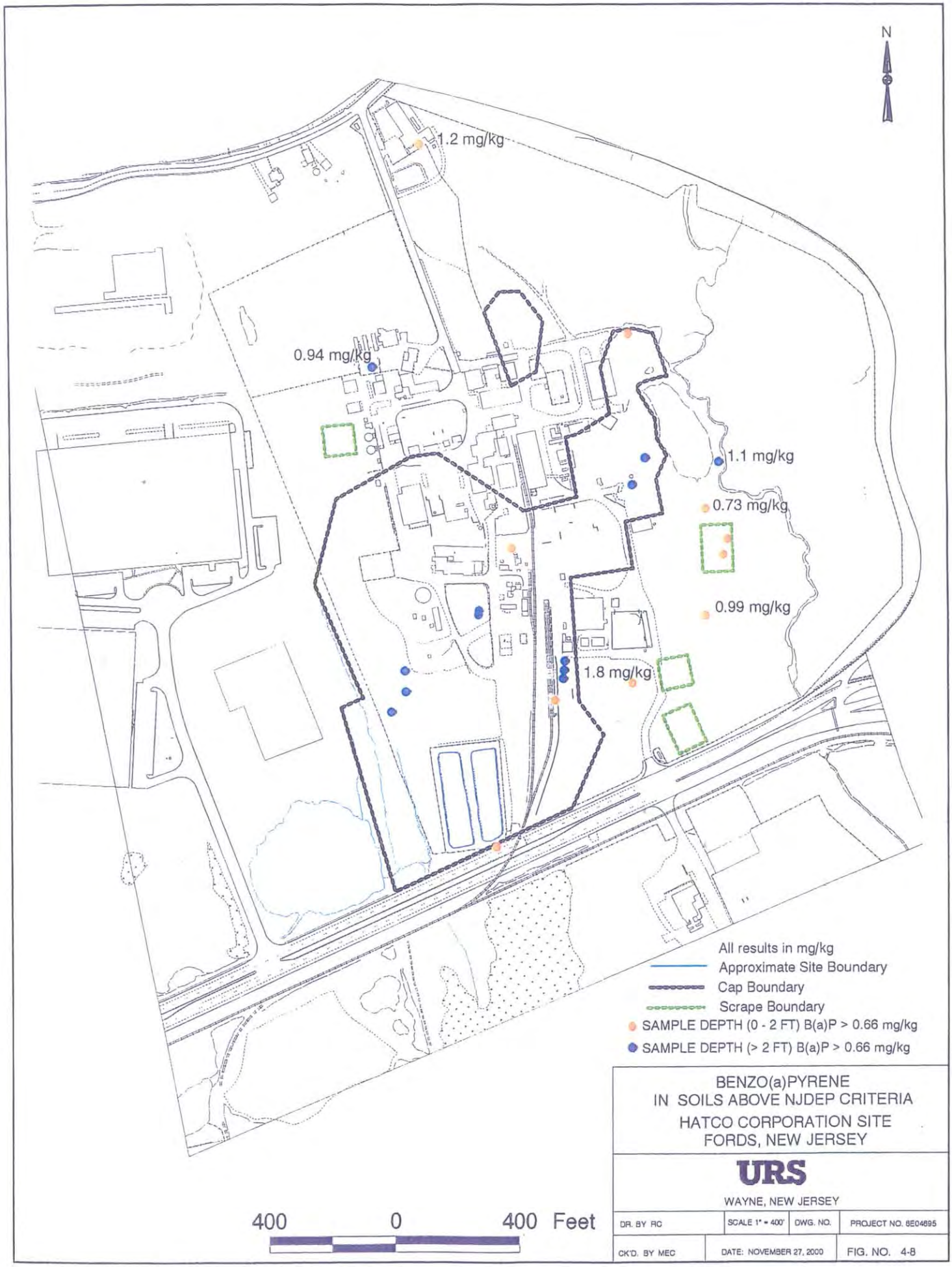
LEAD IN SOILS ABOVE
NJDEP CRITERIA

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. 4 - 7

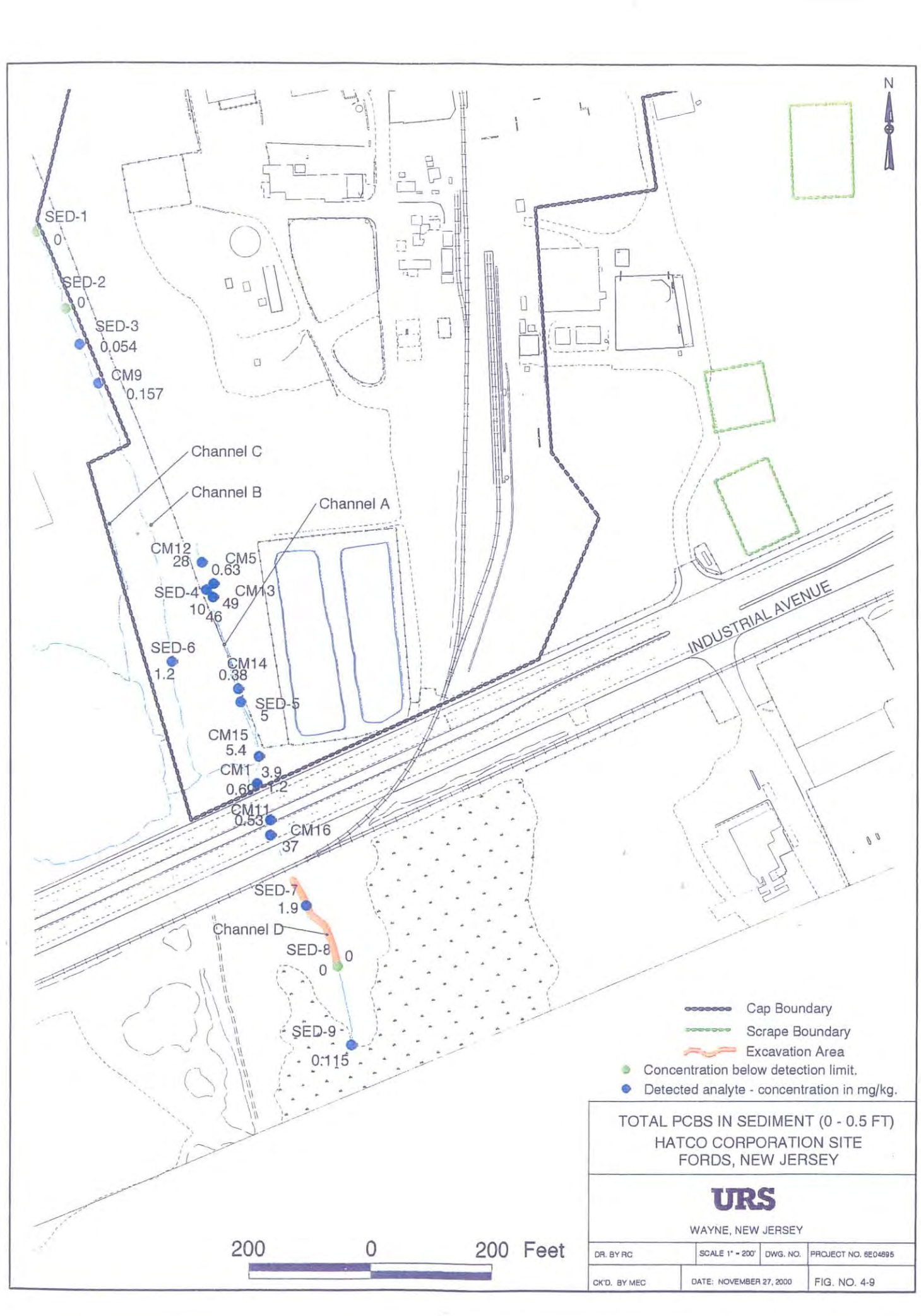


BENZO(a)PYRENE
IN SOILS ABOVE NJDEP CRITERIA
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. 4-8

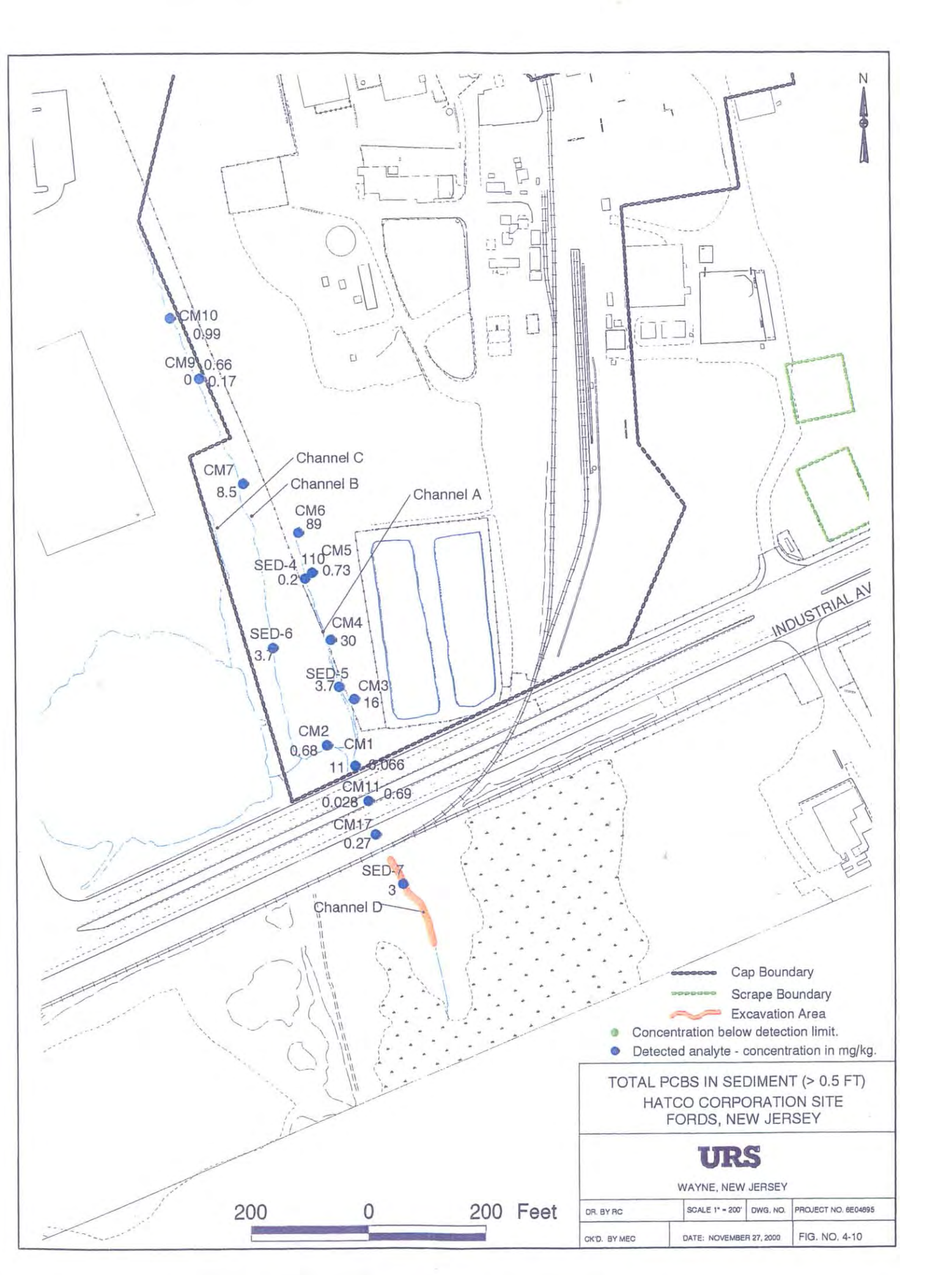


TOTAL PCBS IN SEDIMENT (0 - 0.5 FT)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 200'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. 4-9

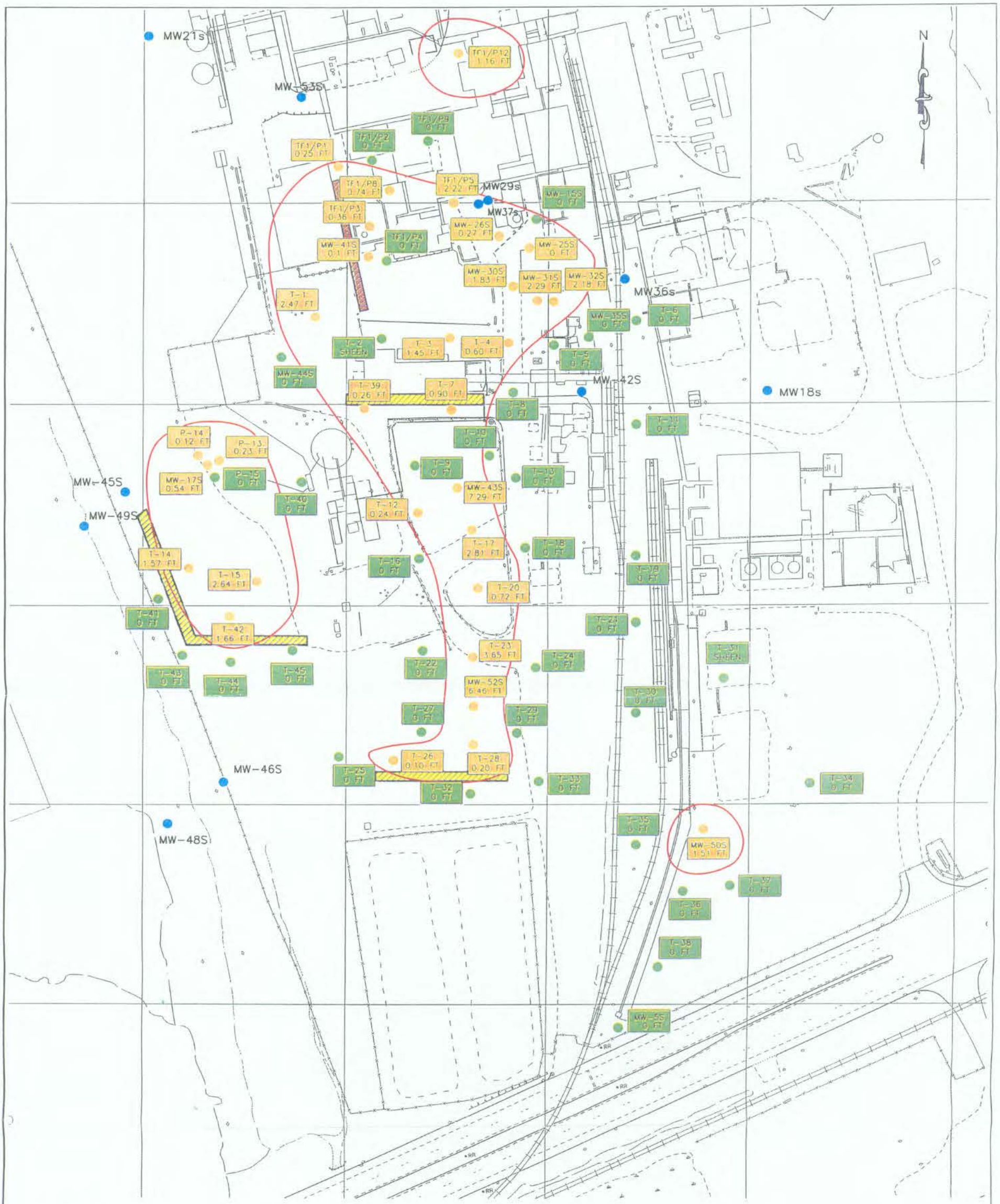


TOTAL PCBS IN SEDIMENT (> 0.5 FT)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 200'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. 4-10



LEGEND:

- WELLS AND TEMPORARY WELLS WITH NO LNAPL DETECTED OR SHEEN ONLY BASED ON MAY–JUNE 1999 MEASUREMENTS
- WELLS AND TEMPORARY WELLS THAT CONTAIN LNAPL BASED ON MAY–JUNE 1999 MEASUREMENTS
- WELLS SCREENED ACROSS THE WATER TABLE THAT CONTAIN NO EVIDENCE OF LNAPL BASED ON OCT–NOV 1998 MEASUREMENTS
- APPROXIMATE EXTENT OF LNAPL
- POTENTIAL LNAPL COLLECTION TRENCH LOCATION
- EXISTING IRM LNAPL RECOVERY SYSTEM

0 125 250

SCALE (FEET)

NOTE:

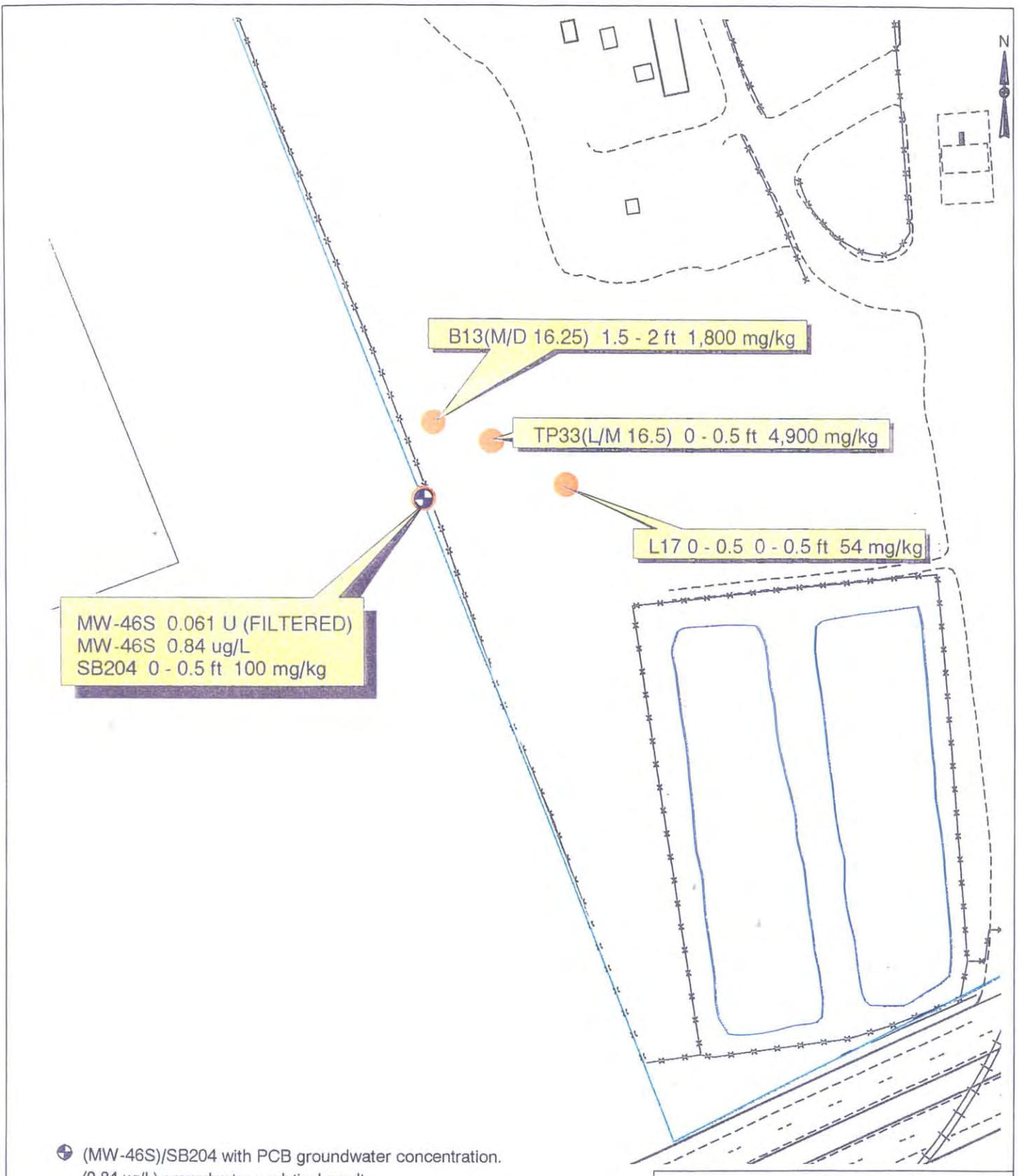
RESULTS ARE SHOWN ONLY FOR THOSE LOCATIONS MEASURED.

POTENTIAL COLLECTION TRENCH LOCATIONS HATCO CORPORATION SITE FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY	DJK	SCALE	AS SHOWN	DWG. NO. 64695130	PROJ. NO. 6E04695
CK'D. BY	MG	DATE	JAN 22, 2001	FIG. NO.	4-11

K:\CADD\6E04695\64695130.dwg, 03/26/2001 10:52:53 AM, 1:1



(MW-46S)/SB204 with PCB groundwater concentration.
(0.84 ug/L) groundwater analytical result
(0.061 U ug/L) filtered groundwater analytical result

Soil sample locations with maximum concentration of PCBs

Approximate Site Boundary

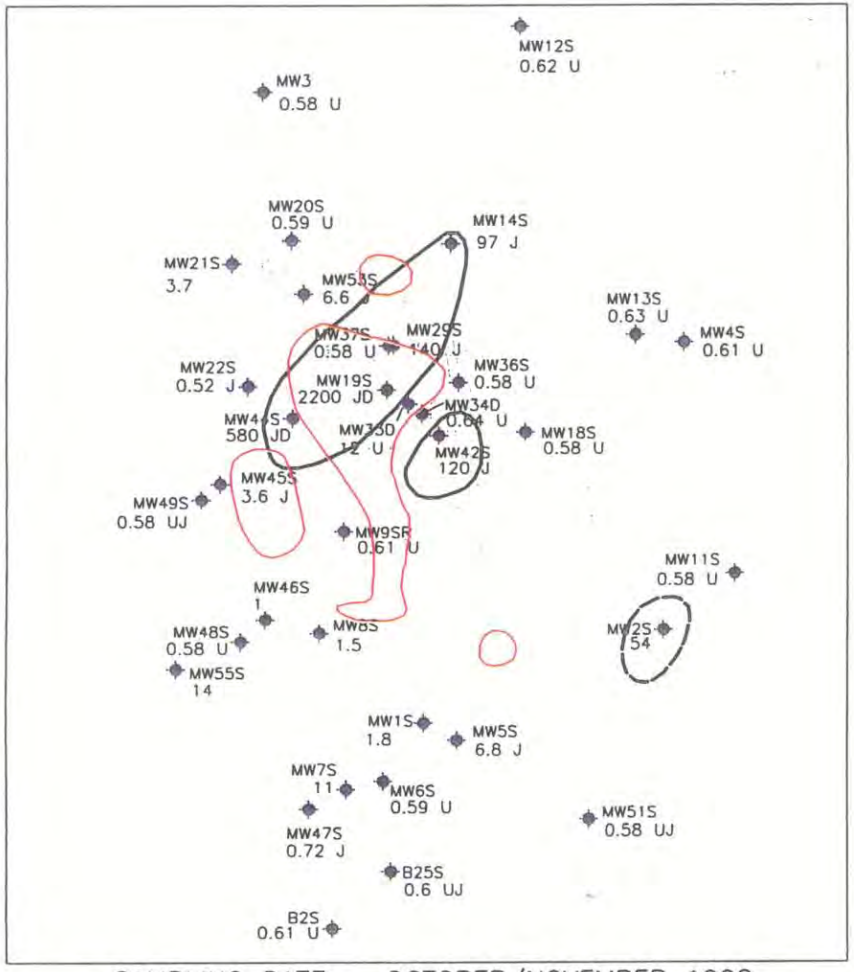
NOTE: Water table approximately 1 foot below ground surface.

100 0 100 Feet

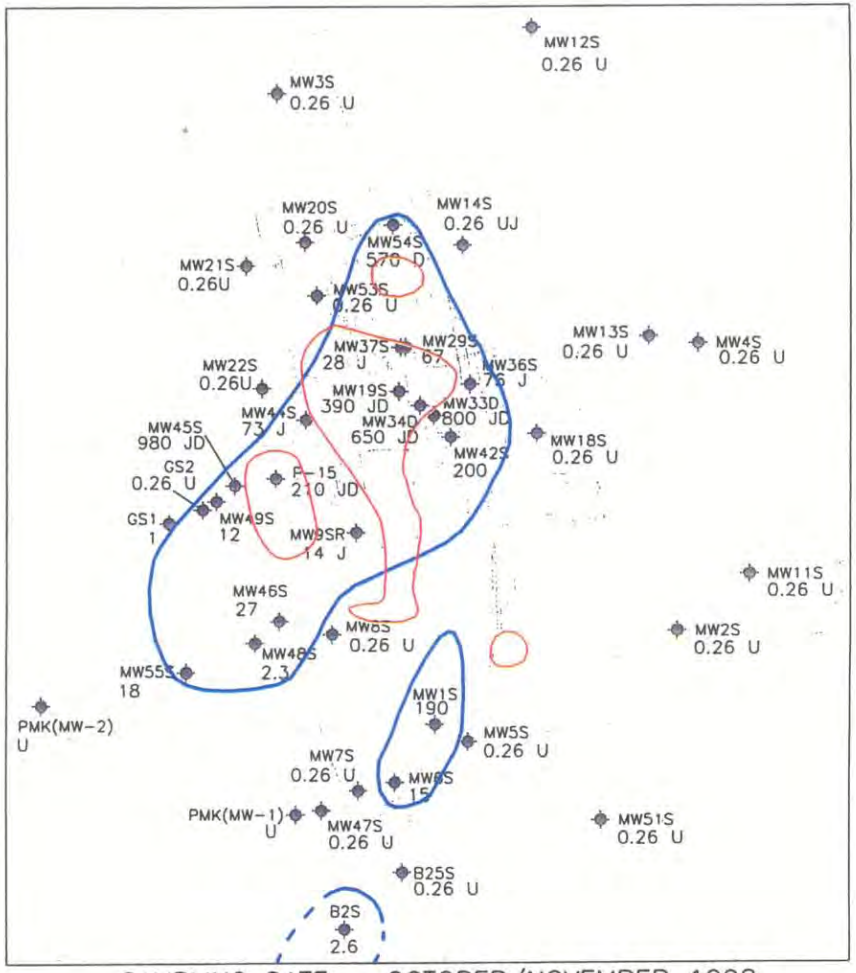
ANALYSIS OF IMPACT TO GROUNDWATER
FROM PCBS IN VICINITY OF MW-46S/SB204
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE: AS SHOWN	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY GRJ	DATE: NOVEMBER 27, 2000		FIG. NO. 4-12



SAMPLING DATE – OCTOBER/NOVEMBER 1998
BIS(2-ETHYLHEXYL)PHTHALATE



SAMPLING DATE – OCTOBER/NOVEMBER 1998
BENZENE

N

LEGEND:

U = NOT DETECTED
J = ESTIMATED CONCENTRATION

1 UG/L CONCENTRATION CONTOUR (DASHED WHERE ESTIMATED)

30 UG/L CONCENTRATION CONTOUR (DASHED WHERE ESTIMATED)

APPROXIMATE EXTENT OF LNAPL

ALL CONCENTRATIONS IN UG/L

0 500 1000
SCALE (FEET)

NOTES:

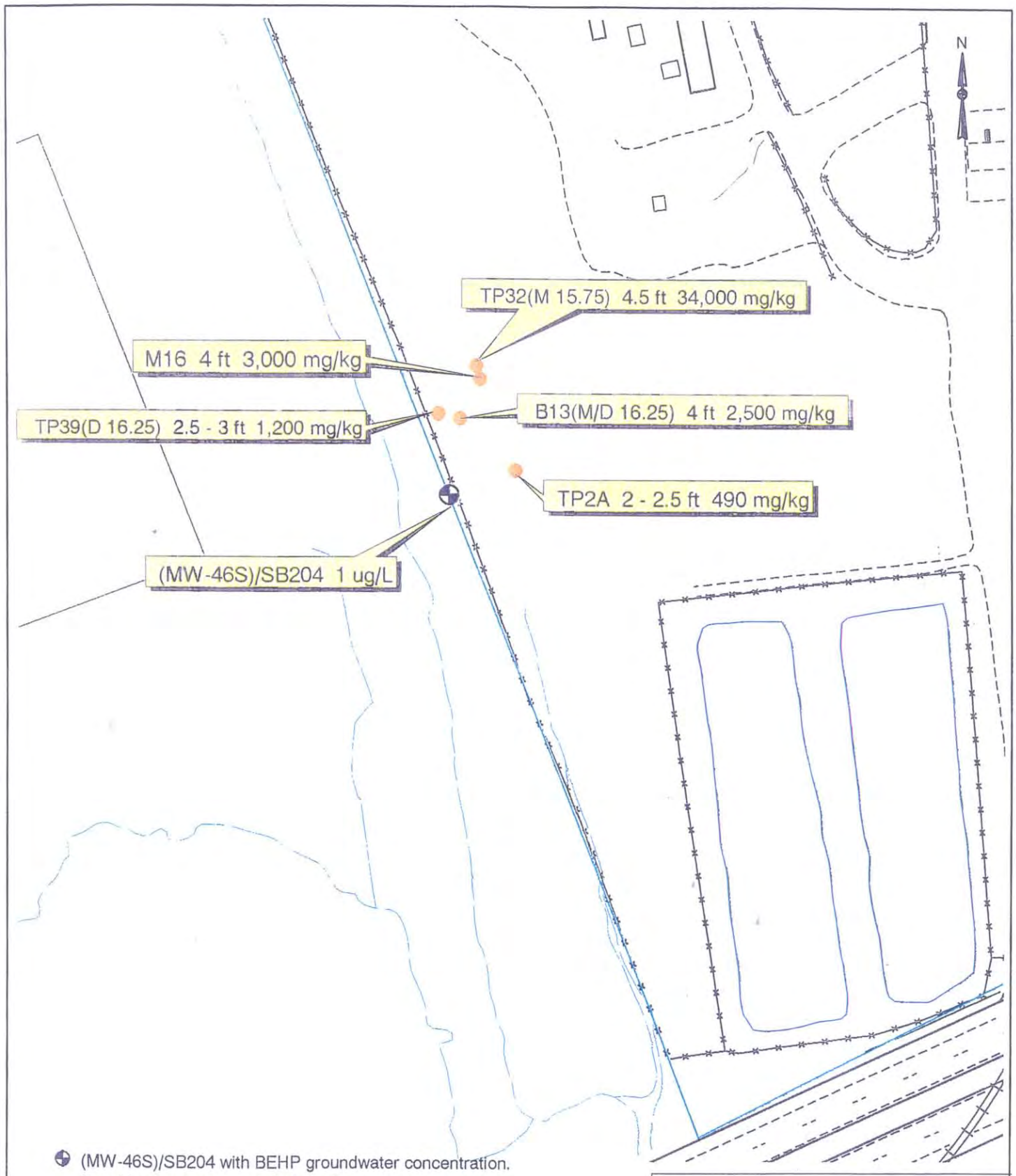
1. NJDEP GROUNDWATER QUALITY STANDARD FOR BENZENE=1 UG/L
2. NJDEP GROUNDWATER QUALITY STANDARD FOR BIS(2-ETHYLHEXYL)PHTHALATE=30 UG/L
3. WELLS MW-33D AND MW-34D ARE SCREENED IN THE SHALLOW WATER-BEARING ZONE.

K:\CADD\6E04695\64695129.dwg

BENZENE AND BIS(2-ETHYLHEXYL)PHTHALATE CONCENTRATIONS IN SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY	ET	SCALE	AS SHOWN	DWG. NO. 64695129	PROJ. NO. 6E04695
CK'D. BY	MEC	DATE	JAN 22, 2001	FIG. NO.	4-13



(MW-46S)/SB204 with BEHP groundwater concentration. (1 ug/L) groundwater analytical result

Soil sample locations with maximum concentration of BEHP

Approximate Site Boundary

NOTE: Water table approximately 1 foot below ground surface.

100 0 100 Feet

ANALYSIS OF IMPACT TO GROUNDWATER FROM BEHP IN VICINITY OF MW-46S/SB204

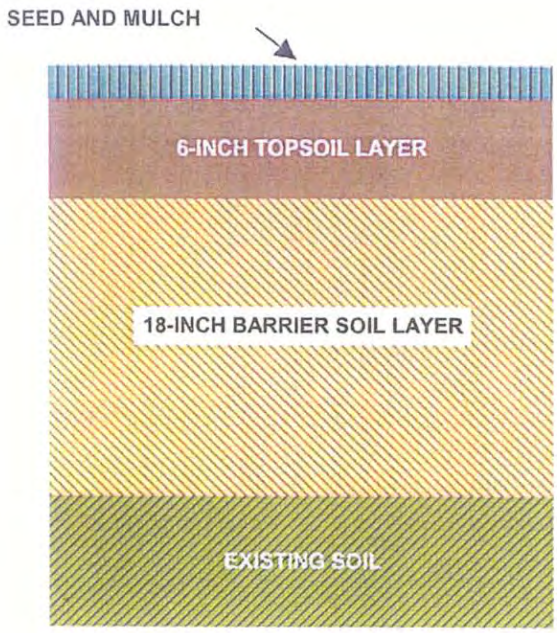
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

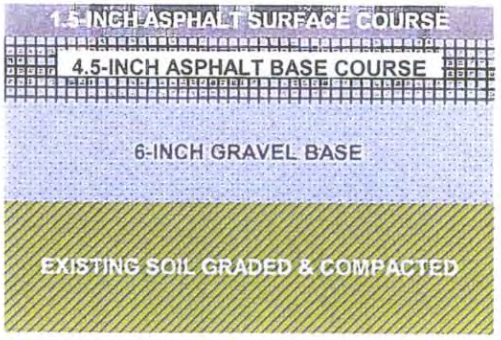
WAYNE, NEW JERSEY

DR. BY RC	SCALE: AS SHOWN	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY GRJ	DATE: NOVEMBER 27, 2000		FIG. NO. 4-14

SOIL CAP CROSS SECTION



ASPHALT CAP CROSS SECTION FOR UNPAVED AREAS



ASPHALT CAP CROSS SECTION FOR EXISTING PAVEMENT

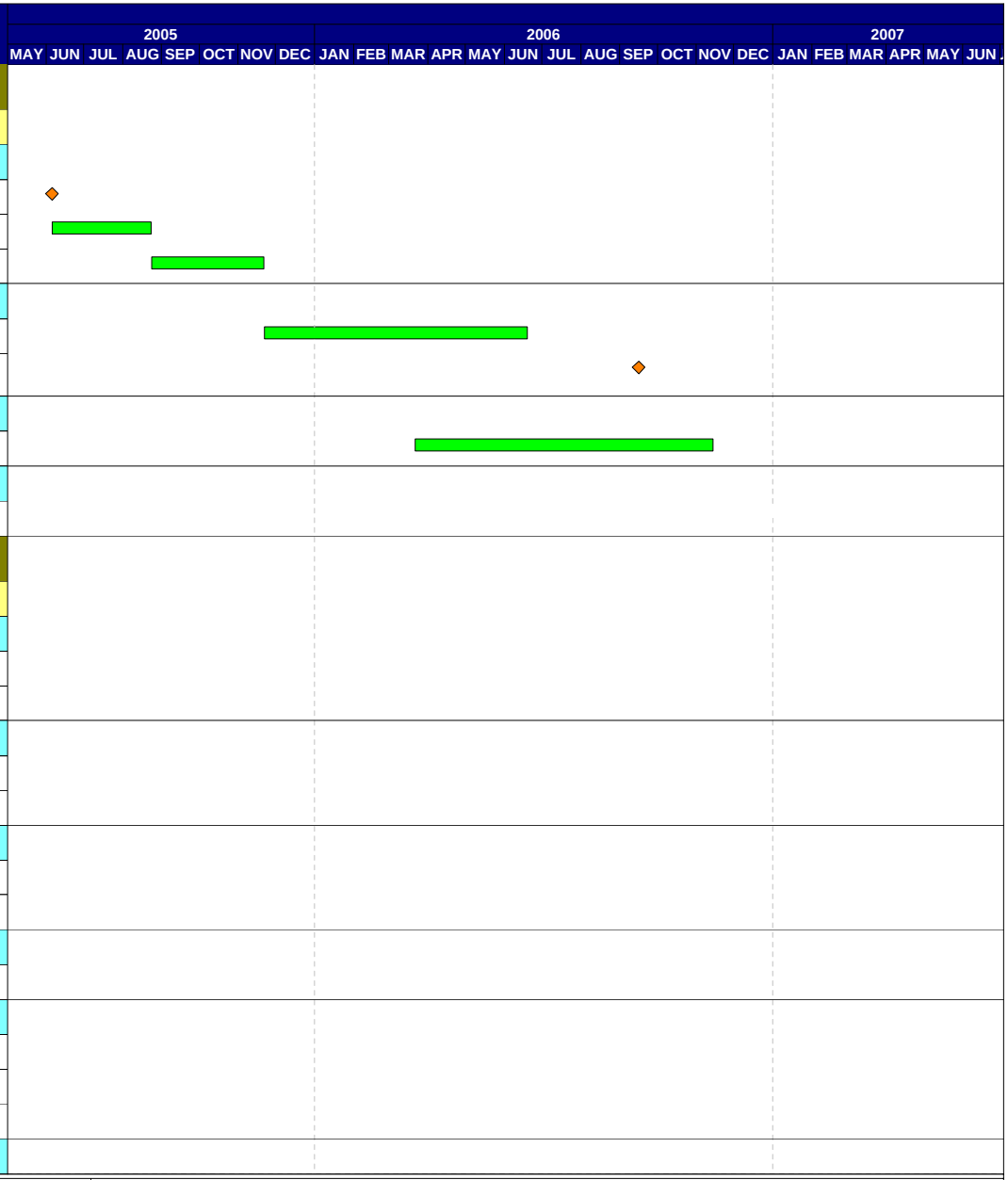
ASPHALT CAP CROSS SECTION FOR GRAVEL AREAS

CAP CROSS SECTIONS
Hatco Corporation Site
Fords, New Jersey

URS
Wayne, New Jersey

Dr. by: MEC	Scale: None	Proj. No.:06E04695.00
Chk'd by: JFR	Date: 2/21/2001	**FIGURE NO. 4-15**

Description	Orig Dur	Early Start	Early Finish
Pre-Remediation			
Mobilization/Design/Permitting			
ACO			
ACO Effective Date	0	06JUN05 *	
RAWP Preparation & NJDEP Submittal	57	06JUN05	23AUG05
NJDEP Review & Approval	90	24AUG05	21NOV05
PRE-DESIGN INVESTIGATION			
PRE-DESIGN INVESTIGATION	150	22NOV05	19JUN06
Revised Project Schedule Submission to NJDEP	0		17SEP06
DESIGN			
DESIGN	170	22MAR06	14NOV06 *
PERMITTING			
PERMITTING	179		
Remediation			
Soil Remediation			
SITE PREP			
Support Facilities	30		
Clearing/Grubbing	20		
LAGOONS			
On-Site Lagoons Water Removal & Disposal	10		
Remediate On-Site Lagoons Sediment/Sludge	30		
ON-SITE SOILS			
Excavate On-Site Soil Scrape Areas	30		
Excavation and Backfill (Soil Options)	73		
OFF-SITE SOILS			
Exc Channel D	20		
CAP - SOIL CONSTRUCTION			
Regrade Soil Cap Area	20		
Wetlands Restoration	30		
Soil Cap Placement	60		
CAP - ASPHALT CONSTRUCTION			



Company name	Weston Solutions, Inc.
Start date	01JAN05
Data date	01JAN05
Run date	19AUG05
Page number	1A

Early bar
Progress bar
Summary bar
Start milestone point
Finish milestone point

Project Implementation Schedule
Hatco Site - Fords, NJ
Figure 8-1

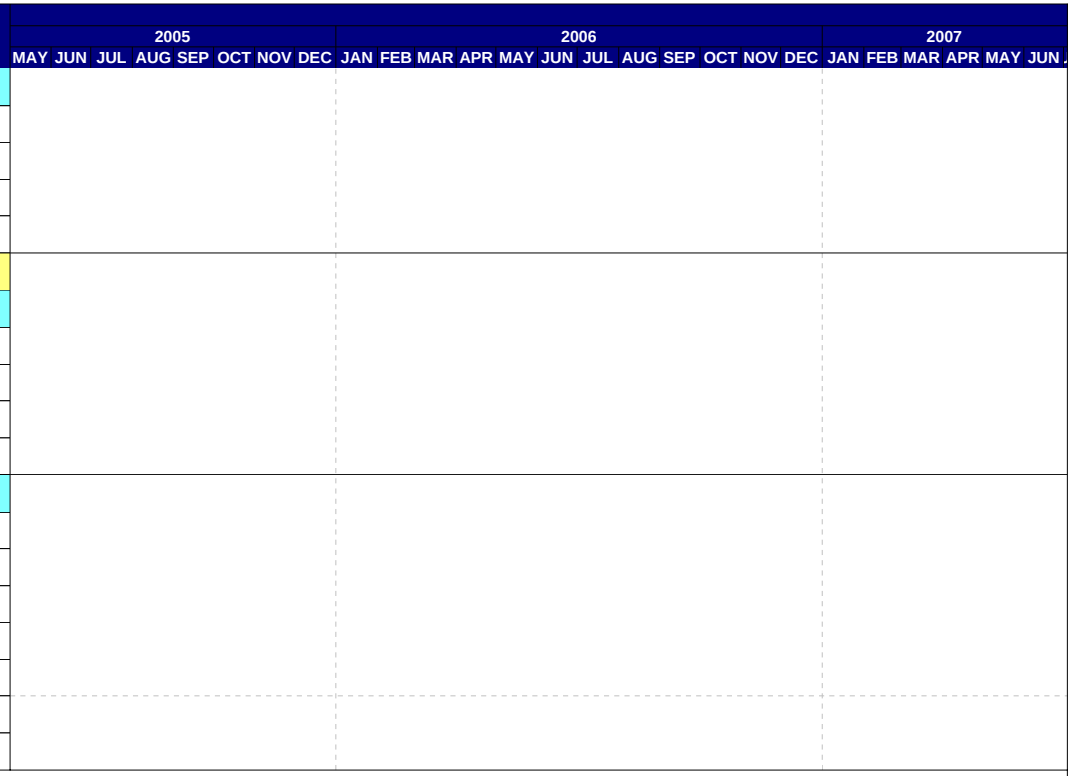
Description	Orig Dur	Early Start	Early Finish
Regrade Asphalt Cap Area	20		
Asphalt - Over Existing	10		
Asphalt - Over Gravel	10		
Asphalt - Over Soil	20		
STORMWATER BASIN CONSTRUCTION			
Stormwater Basin Construction	60		
LNAPL and Groundwater Remediation			
LNAPL AND GROUNDWATER SYSTEM CONSTRUCTION			
Bid LNAPL & GW Systems	60		
Procure Equipment	50		
Treatment Building	45		
Install Equipment	30		
Construct Trench System	45		
Repair Pavement	30		
Piping, Electrical & Startup	30		
Well Installation (GW Monitoring)	30		
Post-Remediation			
O & M			
WETLANDS RESTORATION			
Wetlands Restoration Monitoring (3 years)	1095		
LNAPL SYSTEM			
LNAPL System O&M (Years 1-7)	2557		
LNAPL System O&M (Years 8-14)	1827		
SHALLOW WELL MONITORING			
Shallow Well Monitoring (Years 1-7)	2557		
Shallow Well Monitoring (Years 8-14)	1827		
SHALLOW WELL MNA			
Shallow Well MNA (1 year)	365		
DEEP WELL MONITORING			
Deep Well Groundwater MNA (Years 1-7)	2557		
Deep Well Groundwater MNA (Years 8-14)	1827		

Company name	Weston Solutions, Inc.
Start date	01JAN05
Data date	01JAN05
Run date	19AUG05
Page number	2A

Early bar
Progress bar
Summary bar
Start milestone point
Finish milestone point

Project Implementation Schedule
Hatco Site - Fords, NJ
Figure 8-1

Description	Orig Dur	Early Start	Early Finish
ASPHALT/SOIL CAP			
Asphalt Cap O&M (First 10 of 12 Years)	3660		
Soil Cap O&M (First 10 of 12 Years)	3660		
Asphalt Cap O&M (Years 11 & 12)	730		
Soil Cap O&M (Years 11 & 12)	730		
Demobilization & Final Reports			
DEMOBILIZATION			
Equipment Decontamination	5		
Remove Support Facilities	10		
Support Facilities Area Restoration	5		
Demobilization	5		
FINAL REPORTS			
Final LNAPL RA Report Prep & Approval	90		
Receive LNAPL NFA	0		
Final Soil & Sediment RA Report Prep & Approval	120		
Final GW RA Report	90		
Receive Soil & Sediment NFA	0		
CEA Removal & Receipt of GW NFA	0		
NJDEP Release from ACO	0		



Company name	Weston Solutions, Inc.
Start date	01JAN05
Data date	01JAN05
Run date	19AUG05
Page number	3A

Early bar
Progress bar
Summary bar
Start milestone point
Finish milestone point

Project Implementation Schedule
Hatco Site - Fords, NJ
Figure 8-1

APPENDIX A
ADMINISTRATIVE CHECKLIST FOR REMEDIAL ACTION WORK PLANS

Administrative Checklist For Remedial Action Workplans in accordance N.J.A.C 7:26E

Facility Name: Hatco Corporation Site, Fords, New Jersey

Case #: G000003943

UST #: _____

General Check one:	YES	NO	N/A
1. Table of Contents	X		
Specific			
1. Introduction and summary of site conditions, including areas of concern, data summary, scaled site maps, potential receptors, etc. (SI/RI Report or summary) (N.J.A.C. 7:26E-6.2(a)1 & 2)	X		
2. Remedial Action Selection Report (aka Effectiveness Analysis and Certification) as per P.L. 1993, c. 139, Section 35	X		
3. Soil remediation plan			
a. Detailed description of remedial action and remedial technology for each area of concern (N.J.A.C. 7:26E-6.2(a)5)	X		
b. Post-remedial sampling (N.J.A.C. 7:26E-6.3 & 6.4)	X		
c. Cleanup goals (compound specific) (N.J.A.C. 7:26E-6.2(a)4)	X		
d. Scaled site maps (N.J.A.C. 7:26E-4.9 and 6.2(a)6)	X		
e. Permit requirements/applications (N.J.A.C. 7:26E-6.2(a)8)	X		
f. System specifications and construction information (N.J.A.C. 7:26E-6.2(a)9)	X		
g. Soil erosion and sediment control plan (N.J.A.C. 7:26E-6.2(a)10)	X		
h. Soil disposal/soil re-use plan (N.J.A.C. 7:26E-6.4(b)	X		
4. Ground water remediation plan			
a. Plume(s) delineated	X		
b. Wells properly constructed	X		
c. Flow direction defined, including ground water elevation contour maps	X		

	Check one:	YES	NO	N/A
d.	Detailed description of remedial action and remedial technology for each area of concern (N.J.A.C. 7:26E-6.2(a)5)	X		
e.	Cleanup goals (compound specific) (N.J.A.C. 7:26E-6.2(a)4)	X		
f.	Remedial monitoring plan/effectiveness evaluation plan	X		
g.	Hydraulic control information/maintenance	X		
h.	Treated water discharge location			X[1]
i.	Scaled site maps per N.J.A.C. 7:26E-4.9 and 6.2(a)6	X		
j.	Permit requirements/applications (N.J.A.C. 7:26E-6.2(a)8)	X		
k.	System specifications and construction information (N.J.A.C. 7:26E-6.2(a)9)	X		
5.	Data presentation format and quality assurance project plan (N.J.A.C. 7:26E-6.2(a)7)	X		
6.	Site Specific Health and Safety Plan (N.J.A.C. 7:26E-6.2(a)11)	X		
7.	Site restoration plan and remedial system dismantling plan (N.J.A.C. 7:26E-6.2(a)12 & 13)	X		
8.	Cost estimate (N.J.A.C. 7:26E-6.2(a)14)	X		
9.	Schedule of implementation (N.J.A.C. 7:26E-6.2(a)15	X		

Note: all "no" and "n/a" responses must be accompanied by supporting rational.

[1] The discharge location (e.g., MCUA, surface water) for water treated as part of the LNAPL recovery process will be identified prior to implementation of the LNAPL remediation.

APPENDIX B
RELEVANT CORRESPONDENCE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

MAR 30 2005

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Peter A. Ceribelli
Senior Vice President
Weston Solutions, Inc.
1400 Weston Way, Box 2693
West Chester, Pa. 19380

Dear Mr. Ceribelli:

This letter is the United States Environmental Protection Agency's (EPA) response to, and approval of, Weston Solutions, Inc. (hereinafter, "Weston") January 26, 2004 request, and the August 13, 2004 request modification, for a risk-based PCB disposal approval for portions of the Hatco site located in Fords, Middlesex County, New Jersey, in accordance with the federal regulations for polychlorinated biphenyls (PCBs) promulgated pursuant to the Toxic Substances Control Act (TSCA), 15 U.S.C. § 2601 et seq., and set forth in Part 761 of Title 40 of the Code of Federal Regulations (40 C.F.R. § 761). Prior to Weston's application, a PCB risk-based disposal application for the Hatco site was submitted jointly by Hatco Corporation and W.R. Grace & Co. by letter dated June 19, 2002.

The complete application that EPA considered, and that is the subject of this approval includes the following by this reference:

1) June 19, 2002 letter from Hatco and W.R. Grace & Co. transmitting a document titled "PCB Remediation Proposal And Human Health Risk Assessment For PCB Impacted Soils," dated August 31, 2001. A set of documents transmitted separately to EPA and listed in an Attachment to the June 19, 2002 letter. The listing includes a "Human Health Risk Assessment" (HHRA), a "Draft Remedial Action Work Plan" (RAWP) Volumes 1-5, and "Laboratory Reports," Volumes 6-21.

2) Weston's January 26, 2004 letter containing a modified application, which incorporates the prior application materials, and superseded the June 19, 2002 application submitted jointly by Hatco and W.R. Grace & Co.

3) Weston's August 13, 2004 letter setting forth a modified approach for remediation of the on-site lagoons, superceding the remedial approach set forth for the lagoons in the prior application materials.

It should be noted that the New Jersey Department of Environmental Protection ("NJDEP") reviewed the document, dated August 31, 2001, titled "PCB Remediation Proposal and Human Health Risk Assessment For PCB Impacted Soils," and in comments dated June 2, 2003, stated that the soil remediation proposal and risk assessment were unacceptable. NJDEP therefore required that a revised draft RAWP that addressed NJDEP's comments be prepared. Since that time, as indicated in Weston's January 26, 2004 modified risk-based PCB disposal approval application, as further modified in Weston's August 13, 2004 letter, the remedy has been significantly enhanced to address PCB contamination at the site. The modifications include:

1) extending the area to be covered with the engineered cap to all locations of the site with PCB concentrations greater than 2 mg/Kg (ppm) dry weight;

2) allowing only soils contaminated with PCBs at concentrations less than 500 mg/Kg (ppm) dry weight to remain on-site, with the exception of the two on-site lagoons addressed in item 3 below, and these materials shall be covered with the engineered cap as described in item 1 above; excavated materials containing greater than 500 mg/Kg (ppm) dry weight PCBs that are removed from the site shall be properly disposed of in accordance with federal PCB regulations contained in 40 C.F.R. § 761;

3) excavation and off-site disposal of chemical waste sludges, sediments, and any other material overlying the clay layer in the two on-site lagoons; sampling to verify that no material remaining in the lagoons exceeds a concentration of 500 mg/Kg (ppm) dry weight PCBs; verify the integrity of the clay layer and, if necessitated by any observed loss of integrity, restore the integrity of the clay layer; collapse of the berm separating the lagoons; backfill of the lagoons with soil from other areas of the Hatco site determined to contain less than 500 mg/Kg (ppm) PCBs (including areas identified in the draft RAWP that lie beyond the Hatco Corporation property boundary); capping those backfilled materials excavated from other areas of the Hatco site determined to contain greater than 50 mg/kg (ppm) PCB mg/kg with a geotextile of not less than 50 mil thickness and a permeability of not less than 10E-7 cm/sec; and cover of the lagoon backfill with clean fill to a thickness of not less than two feet. Materials excavated from the lagoons shall be managed, including separation of liquid and non liquid fractions, and disposed of off-site in accordance with PCB disposal regulations contained in 40 C.F.R §761.61(b); and

4) identification and placement of all locations at the site with PCBs in excess of 0.49 mg/Kg (ppm) dry weight under a deed restriction;

5) verification of the perpetual protectiveness of the remedy by long term monitoring.

Based on the information provided in the application, including the five modifications outlined above, EPA has determined that implementation of the remedy and disposal actions

proposed in the application will not pose an unreasonable risk of injury to health or the environment.

Region 2 staff prepared a draft approval and published a public notice on January 10, 2005 in the Newark Star Ledger and the Home News-Tribune establishing a 30 day public comment period on the draft approval. The full application and extensive background materials were made available for public review at the EPA Edison office and at the Woodbridge Library - Fords, New Jersey, branch. No public comments were received during the 30 day public comment period.

EPA Region 2 reviewed the application to determine whether the proposed remedy would be protective of public health and the environment, is technically feasible and appropriate, is consistent and supportive of the NJDEP's plans for remediation of the site, and that safeguards are in place to ensure that long-term operation, maintenance, and monitoring commitments associated with the remedy would be undertaken.

By this letter, EPA hereby issues approval for the risk-based disposal of soils, sediments, pond "muck," and phthalic anhydride wastes contaminated with PCBs, and PCB contaminated materials located at the Hatco site, subject to the conditions specified in this letter. This approval is being issued under the authority granted to EPA by the Toxic Substances Control Act (TSCA) as codified in 40 C.F.R. § 761.61(c), (OMB Control Number 2070-0159). This approval also constitutes an order under the authority of Section 6 of TSCA, 15 U.S.C. § 2605.

1. Effective Date and Review Date

This approval shall become effective on the date that the Regional Administrator (RA) of EPA Region 2 receives written notification from Weston of its acceptance and intention to comply with the conditions of this letter. The person providing such written notification must be an officer of Weston. This offer may be withdrawn if EPA Region 2 does not receive written notification from Weston of its acceptance of, and intention to comply with, the conditions and terms of this approval within 45 days of the date of the bankruptcy court's order approving the Remediation Agreement by and among Weston, Hatco and Grace, and the Revitalization Settlement Agreement by and among the NJDEP, Weston, ACE Financial Solutions, Inc., Hatco, and Grace and its affiliates, or other such date as may be agreed to by the parties.

The EPA will review this approval no later than 5 years from its effective date. At that time, if the EPA finds that the continued implementation of the remedy granted by this approval presents an unreasonable risk to health or the environment, the EPA may modify, suspend, or revoke this approval. Alternatively, the EPA may request further information to make such a determination.

2. Description of Extent of PCB Contamination

The Hatco site, a portion of which is contaminated with PCBs above 50 mg/Kg (ppm) dry weight and is therefore the subject of this approval, is located at 1020 King Georges Post Road, Fords, Middlesex County, New Jersey. This site encompasses 80 acres and is bordered by King Georges Post Road to the North, Industrial Avenue to the south, Route 440 and Interstate I-287 to the east, and a tributary to Crows Mill Creek to the west. Approximately 15 acres of the site are developed. Chemical manufacturing, processing, storage, and waste residuals management facilities, research and quality control laboratories, and management and sales offices are located at the site. The Hatco site discussed herein also includes an area to the west of the Hatco property boundary and an area south of Industrial Avenue (known as Channel D) which are described in the draft RAWP.

PCBs were detected in 852 of the approximately 1,300 soil samples analyzed for these compounds. Detected concentrations range from 0.0033 mg/Kg (ppm) to 12,000 mg/Kg (ppm). Soils containing more than 100 mg/Kg (ppm) PCBs are generally limited to portions of the "Main Production Area", the "Muck" area, the four former unlined ponds, and two former chemical waste lagoons. A few samples collected outside of the Main Production Area were contaminated with PCBs at concentrations greater than 100 mg/Kg (ppm). Surface soil contamination between 2 mg/Kg (ppm) and 100 mg/Kg (ppm) exists over a wider portion of the developed area of the site, beyond the Main Production Area.

The Muck area is located near the western border of the site, where semi-solid materials from the ponds were periodically removed and placed on surface soils. PCB contamination in the Muck area was detected up to12,000 mg/Kg (ppm), with the highest levels of contamination present in the interval between two (2) and six (6) feet below ground surface (bgs).

The four on-site ponds received wastewater from manufacturing operations during the 1960's. In 1970, the ponds were excavated, filled and covered with soil, and a portion covered with asphalt. The maximum concentration of PCBs reported in the pond area is 8,600 mg/Kg (ppm), detected in a sample collected between 7 – 7.5 ft bgs.

In the mid 1960's, two (2) clay lined lagoons were constructed to receive chemical manufacturing wastewater effluent, recover floating organic chemical waste, and moderate flow of wastewater to the Middlesex County Utilities Authority. The two lagoons were removed from service during "Project 50" in 1991. PCB contamination exceeding 500 mg/Kg (ppm) has been detected in the lagoons.

Floating free product organic chemicals (also known as light non-aqueous phase liquid or LNAPL) are present on groundwater at two main areas: one extending from the Main Production Area southward to just north of the former lagoons; and a second within the former Muck area. The LNAPL plume at the north end of the Main Production Area is approximately 0.13 feet

thick; at the south end of the Main Production Area, LNAPL is about 1.72 feet thick; and at the former Muck Area, LNAPL is about 0.06 feet thick. The maximum PCBs concentration reported in the LNAPL was 90,000 mg/Kg (ppm). The total combined length of the LNAPL contaminated areas is approximately 1,250 feet.

The reported concentrations of PCBs in shallow groundwater monitoring wells ranged up to 24,000 ug/L (ppb), detected in the monitoring well designated MW-15S during the October 1991 sampling.

3. Remedial Action, Cap Remedy, and Long Term Monitoring

This approval applies to all portions of the Hatco site contaminated with PCBs at concentrations greater than or equal to 50 mg/Kg (ppm) (hereinafter, the "TSCA Remediation Area"), unless otherwise addressed. The TSCA Remediation Area and those areas where PCBs are present at concentrations greater than the NJDEP Cleanup Standard of 0.49 mg/Kg (ppm) (hereinafter, the "Total Remediation Area) will be subject to an Administrative Consent Order (ACO), executed between Weston and NJDEP. Those portions of the site with PCB contamination at concentrations less than 50 mg/Kg (ppm) dry weight are also subject to, and will be addressed in accordance with, NJDEP requirements.

Weston shall comply with the draft Remedial Action Workplan (RAWP), as modified to incorporate the terms of the January 2004 application, Weston's August 13 letter, and this approval, unless EPA Region 2 provides written approval of any additional modification. Notification of intent to modify the remedy must be received by EPA at least 60 calendar days prior to the proposed implementation of the modification. The provisions of this approval supercede any inconsistent provisions which may be contained in the RAWP as modified by the January 2004 application and Weston's August 13, 2004 letter.

Weston shall excavate and dispose of off-site, in accordance with 40 C.F.R. Part 761, all PCB containing material at concentrations greater than 500 mg/Kg (ppm) dry weight. Weston shall also excavate and dispose of off-site, material from the former lagoons, as described previously in this approval letter, and conduct long term monitoring to verify the perpetual effectiveness of the remedy. All remedial and monitoring work shall be performed in accordance with an engineering and monitoring plan, approved in advance, in writing, by EPA Region 2. No later than thirty (30) days after excavating and disposing of the soil, Weston shall submit to EPA Region 2 a certification, signed by a professional engineer licensed by the State of New Jersey, verifying that such work has been completed in accordance with the draft RAWP and this approval. Weston shall also maintain in perpetuity, the following records:

1) "as-built" engineering drawings which provide latitude and longitude determined using differential global positioning or an equivalent method which conforms to the EPA

locational data standard available online under the "Data Standards" link at **http://www.epa.gov/edr/**;

2) construction related documents including engineering specifications for all purchased, manufactured, or otherwise fabricated elements associated with the remedy;

3) purchase receipts and/or certifications associated with all components of the remedy;

4) lists or logsheets which record the identity and affiliation of all personnel associated with off-site management, design, or procurement, and on-site implementation of the remedy;

5) all records and information related to characterization, analysis (verified by analysis using an appropriately sensitive and selective EPA SW-846 method or validated equivalent), shipping, and disposal of materials associated with this portion of the remedy and the long term monitoring.

In addition, Weston shall consolidate the remainder of the contaminated material under an engineered cap to contain PCBs at concentrations of 2 mg/Kg (ppm) or greater (surface and subsurface soils). The capped area will include the Muck Area and the former ponds.

Crows Mill Creek (referred to as Channel D in the draft RAWP) sediments that contain PCBs above 1 mg/Kg (ppm) dry weight shall be removed and placed under the main on-site cap. Off-site contaminated soils from the areas west of the site boundary containing PCBs at concentrations over 2 mg/Kg (ppm) will be capped in place.

Areas of the site where the remedial action is for placement of a soil cap per Section 4.4.1 of the March 29, 2001 draft Remedial Action Workplan (RAWP) as modified by the January 2004 application and Weston's August 13 letter, shall be capped with a minimum of 18 to 24 inches of clean soil [i.e. containing <1 mg/Kg (ppm) PCB per 40 C.F.R. § 761.125(a)(2)(ii)], constructed, at minimum, to meet the specifications provided in 40 C.F.R. § 761.61(a)(7). Within thirty (30) days of completing the cap remedy, Weston shall submit to EPA Region 2 the following:

1) a certification, signed by a professional engineer licensed by the State of New Jersey, verifying that such work has been completed in accordance with the Draft RAWP and this approval, and

2) certification of the source, and PCB concentration - determined by analysis using an appropriately sensitive and selective EPA SW-846 method or validated equivalent - of "clean soil" utilized in the remediation.

4. Recording of Approval and Deed Notice

Within sixty (60) days of construction of the cap remedy, as described in the draft RAWP as modified by the January 2004 application and Weston's August 13 letter, and above, Weston shall prepare a Deed Notice and request the then owner(s) of the site **and off-site areas of the site** to record the Deed Notices, in accordance with 40 C.F.R. § 761.61(a)(8) and New Jersey law, with the County Clerk's Office, Middlesex County, New Jersey. The Deed Notice shall be consistent with NJDEP requirements and shall include: a description of the extent of contamination found at the site; a description of the removal action and cap remedy; the restrictions on use included in Section 7 of this approval; and a copy of this approval, appended as an attachment. Within 10 days of receipt of a stamped, filed Deed Notice, Weston shall submit a copy of same to EPA Region 2.

5. Inspection and Maintenance Obligations; Annual Report to EPA.

Weston shall provide EPA Region 2 with an update of the status of the remediation project every three (3) months following the effective date of this approval until the capping, removal, and disposal operations are complete. After the caps are completed, Weston shall visually inspect the caps at least annually, and maintain the caps as needed. Weston shall also provide for a means of communicating with the owner of the site regarding any and all activities at the site which did or may result in any disruption, damage, removal, or other loss of integrity of the cap, and Weston shall inspect the cap within five (5) working days of such notification. If necessary, the cap shall be repaired or replaced within 14 working days of the verification of damage or other loss of integrity. Within 14 working days of completion of repairs, Weston shall submit to EPA the following information:

1) notification that the cap has been breached or otherwise suffered damage or loss of integrity;

2) certification, signed by a professional engineer licensed by the State of New Jersey, that the cap has been repaired or replaced to a condition not less than that constructed as required by this approval.

The caps shall be maintained to prevent access to the contaminated material (e.g. soil and debris) under the caps and to prevent such material from being released. Weston shall also, by July 1 of each year, submit to EPA Region 2 an annual written summary report covering the previous reporting period (January through December of the previous year). The Annual Report shall provide the following information:

1) reports of visual inspections and maintenance needed to maintain the as-built integrity of the cap;

2) maintenance reports;

3) information regarding any problems maintaining any element of the remedy.

6. Sale of the Property

If Weston is advised that the then owner of the site intends to sell or lease any portion of the TSCA Remediation Area, it shall notify EPA Region 2, in writing, of the sale or lease of any portion of the TSCA Remediation Area no later than 30 days after receiving such advice prior to such action. This notification shall include the name, address and telephone number of the new owner(s). As permitted by the access agreements. Weston shall visually inspect the caps within 30 days prior to sale or lease of any such property, and shall, thereafter, provide a written report of the results of inspection, and any as yet unreported inspections and /or maintenance on the caps, to EPA Region 2 and to the buyer or lessee no later than 10 days prior to such sale or lease. In the event that the owner of the Hatco site sells or leases any portion of the TSCA Remediation Area, Weston shall continue to be bound by all the terms and conditions of this approval, unless the following occurs:

1) the new owner or any lessee requests, in writing, that EPA Region 2 reissue this approval to the new owner or lessee, transferring all responsibility to comply with the terms and conditions of this approval to the new owner or lessee;

2) EPA Region 2 reissues this approval to the new owner or any lessee, transferring all responsibility to comply with the terms and conditions of this approval to the new owner or lessee; and

3) the new owner or any lessee provides written notification to EPA Region 2 of their acceptance of and intention to comply with the terms and conditions of the reissued approval. The reissued approval may be withdrawn if EPA Region 2 does not receive written notification from the new owner or lessee of their acceptance of, and intention to comply with, the conditions and terms of the reissued approval within 45 days of the date of the reissued approval. Under such circumstances, this approval, issued to Weston, will remain in effect. In such case, Weston shall provide EPA, in writing, documentation that Weston will be afforded access to the site, as necessary, to fulfill any and all obligations included in this approval.

7. Modifications and Changes in Use

Any modification(s) in the plan, specifications, or information submitted in Weston's application or draft RAWP as modified by the January 2004 application and Weston's August 13 letter, based on which this approval has been issued, must receive prior written approval from EPA Region 2. Minor modifications to this approval may be authorized, in writing, by the Chief

of the Pesticides and Toxic Substances Branch. Weston shall inform EPA Region 2 of any change, in writing, at least 60 days prior to such change. No action may be taken to implement any such modification unless EPA Region 2 has approved of the modification, in writing. EPA Region 2 may request additional information in order to determine whether or not it approves of the modification. If such modification involves a change in the use of the TSCA Remediation Area, EPA may revoke, suspend and/or modify this approval if it finds that Weston's remedy may pose an unreasonable risk to health or to the environment due to the change in use, or if EPA Region 2 does not receive information it deems appropriate from Weston or Hatco to make a determination regarding such potential risk. Weston shall prepare and request that the owner of the site record any amendment to the Deed Notice and/or this approval, resulting from any modification(s), within 60 days of such changes(s).

8. EPA Entry and Inspection

Hatco has provided EPA assurance that EPA representatives may enter the site at reasonable times for the purposes listed below. Weston shall, also, allow any authorized EPA representatives to enter the site at reasonable times for the purposes listed below:

1) to inspect the TSCA Remediation Area of the Hatco site to assess compliance with this approval and/or the federal PCB regulations;

2) to inspect any records related to this approval and/or federal PCB regulations;

3) to take samples for the purpose of assessing compliance with this approval and/or the federal PCB regulations.

Any refusal to allow any of the above actions may result in the suspension and/or revocation of this approval.

All notifications, documents, and requests to be submitted to EPA Region 2 as specified in this approval shall, unless EPA Region 2 later indicates otherwise in writing, be sent to:

Chief
Pesticides and Toxic Substances Branch
United States Environmental Protection Agency, Region 2
2890 Woodbridge Avenue (MS-105)
Edison, New Jersey 08837-3679
Telephone (732) 321-6765 Facsimile (732) 321-6788

This approval, issued pursuant to 40 C.F.R. § 761.61(c), is subject to Weston having provided EPA Region 2 with complete and forthright disclosure of all material facts. Any misrepresentation or omission by Weston of any material fact in Weston's application or the

draft RAWP may result in EPA's revocation, suspension and/or modification of this approval, in addition to any other legal or equitable relief or remedy EPA may choose to pursue under applicable law.

Weston's acceptance of this approval constitutes Weston's agreement to comply with: 1) all conditions and terms of this approval, and 2) all applicable provisions of federal, state and local law. This approval specifies the requirements applicable under TSCA and does not make any determination regarding requirements which may be applicable under other federal, state or local law. TSCA disposal requirements do not supercede other, more stringent, applicable federal, state or local laws, including any applicable requirements under the Solid Waste Disposal Act and its amendments, including the Resource Conservation and Recovery Act. Any failure by Weston to comply with any condition or term of this approval shall constitute a violation of said approval, which has been issued pursuant to 40 C.F.R. § 761.61(c); such violation is made unlawful by Section 15(1)(C) of TSCA, 15 U.S.C. § 2614(C). Any such violation(s) may result in an action by EPA for any legal or equitable relief or remedy available under applicable law. Any such violation might also result in EPA revoking, suspending and/or modifying this approval.

Based on the information included in Weston's application, EPA Region 2 finds that the PCB disposal authorized under this approval will not present an unreasonable risk to health or the environment. Permitted levels of PCB concentration for material remaining on-site under this approval are based on a site specific risk determination pursuant to TSCA, and are not applicable to any other site. Notwithstanding, this approval may be revoked, suspended and/or modified after Weston's acceptance thereof at any time if EPA Region 2 determines that implementation of this approval may present an unreasonable risk of injury to health or the environment. Nothing in this letter is intended or is to be construed to prejudice any right or remedy concerning the operation of Hatco's facility otherwise available to EPA under Section 6 of TSCA, 15 U.S.C. § 2605 and/or 40 C.F.R. § 761.

If you have any questions about the approval, or the request for additional information regarding the chemical waste lagoons, please contact Dennis McChesney of the Pesticides and Toxic Substances Branch at 732-906-6817.

Sincerely,

for Kathleen C. Callahan
Acting Regional Administrator

cc: Commissioner Bradley M. Campbell
New Jersey Department of Environmental Protection

Stephen E. Maybury, Bureau Chief, BEECRA
New Jersey Department of Environmental Protection

Richard J. Codey
Acting Governor

State of New Jersey
Department of Environmental Protection
Division of Remediation Management and Response
Bureau of Case Management
P.O. Box 028
Trenton, New Jersey 08625

Bradley M. Campbell
Commissioner

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
NO._____

FEB 17 2005

Mitch Obradovic
Remedium Group, Inc.
6401 Poplar Avenue, Suite 301
Memphis, TN 38119-4840

Dear Mr. Obradovic:

Re: Hatco Corporation Site
Woodbridge Township, Middlesex County

The New Jersey Department of Environmental Protection's (NJDEP or Department) Bureau of Case Management has completed its review of the November 15, 2004 document entitled "Second Addendum Letter to March 2001 Remedial Action Workplan" (Revised RAWP), prepared by Weston Solutions Inc., on behalf of the Hatco Corporation (Hatco). The NJDEP's review of the subject document has concluded that it is conditionally acceptable provided the comments identified below are adequately addressed within a comprehensive version of the RAWP to be submitted to NJDEP and USEPA prior to implementation.

General Comment:

Hatco has submitted a site specific human health risk assessment to USEPA to support their proposal for a risk-based PCB disposal approval in accordance with 40 CFR 761.61(c). The Revised RAWP states that the risk-based proposal has been tentatively approved by USEPA and that Hatco and Weston are awaiting the final approval letter. Therefore, the NJDEP finds that the RAWP is acceptable conditioned upon Hatco receiving written approval of their risk-based remedy from USEPA.

Specific Comments:

1. Hatco is proposing to use 2.0 mg/kg as the action level for remediation of off-site soils contaminated with PCBs, pending negotiations with neighboring property owners regarding the establishment of deed restrictions. This is acceptable to NJDEP, provided that Hatco provides NJDEP with written proof that the adjacent property owners are willing to place a deed restriction on their property. In the event that Hatco cannot secure deed restrictions on off-site properties, the NJDEP's Residential Direct Contact Soil Cleanup Criteria of 0.49 ppm must be used as the PCB soil cleanup criteria.

2. It is stated in the description of the remedy for the lagoon that off-site sediments and soil will be placed in the lagoons prior to cap construction. It is also stated in the description of the

remedy for the offsite soils exceeding 2 mg/kg PCBs and sediments exceeding 1 mg/kg will be covered with a soil cap. Hatco must provide clarification regarding the fate of the offsite soil and sediments. Specifically, the RAWP should confirm that these contaminated materials will be excavated and placed onsite under the cap.

3. Hatco must submit a revised implementation schedule for NJDEP review and approval.

In accordance with the Administrative Consent Order, Hatco must submit a *complete* final version of the RAWP, which addresses all of NJDEP's and USEPA's comments, within ninety days (90) of receipt of this letter.

If you have any questions concerning these matters, please contact me at 609-633-1460.

Sincerely,

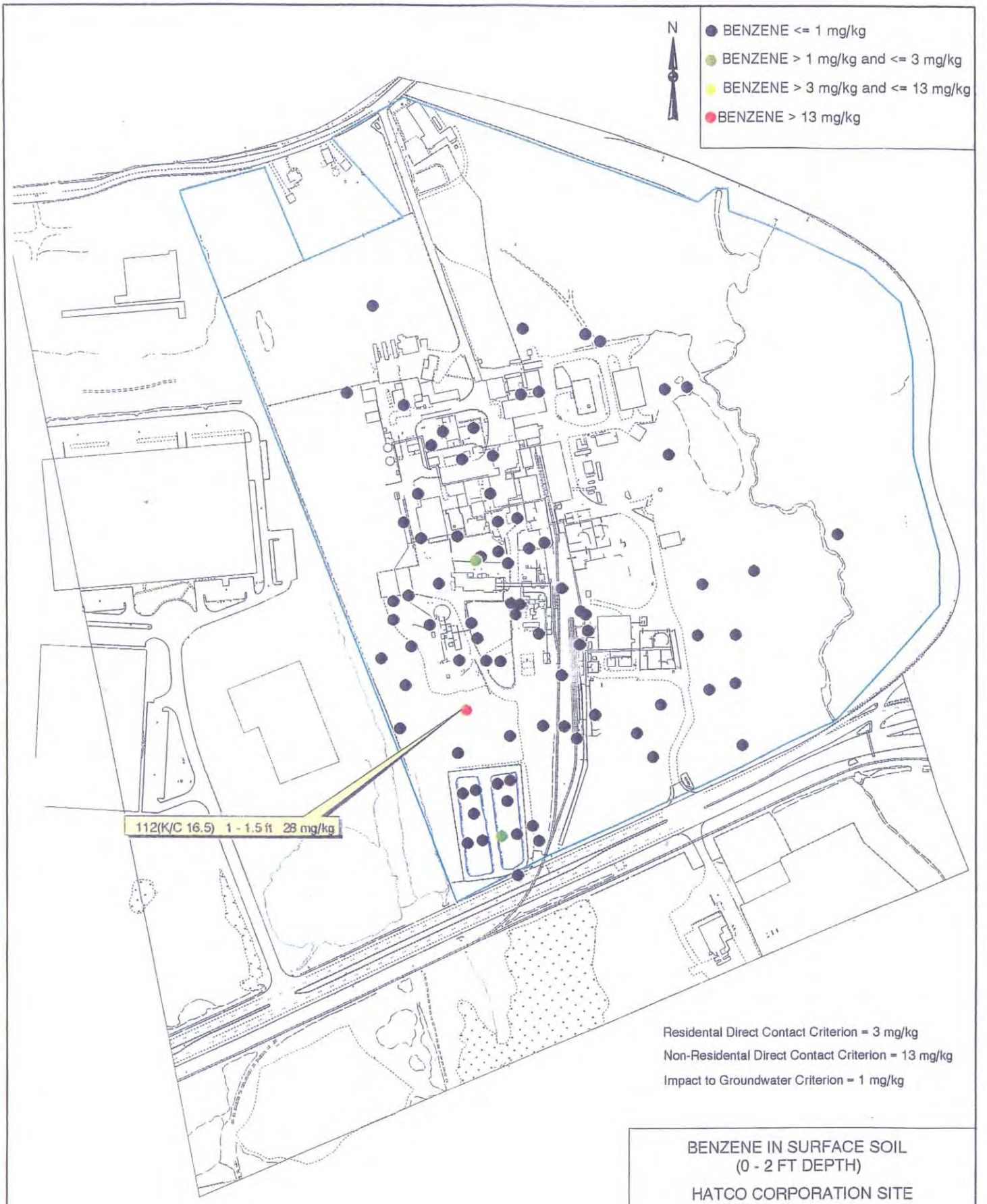
Christopher Kanakis, Site Manager
Bureau of Case Management

Enclosure.
C: Bruce Venner, Bureau Chief
Ken Petrone, Section Chief
James Kealy, BEERA
Anne Pavelka, BGWPA
Dan Kraft, USEPA
Dennis McChesney, USEPA
Janine MacGregor, NJDEP

Appendix C
Historical Data Database

This data has previously been submitted

LIST OF FIGURES

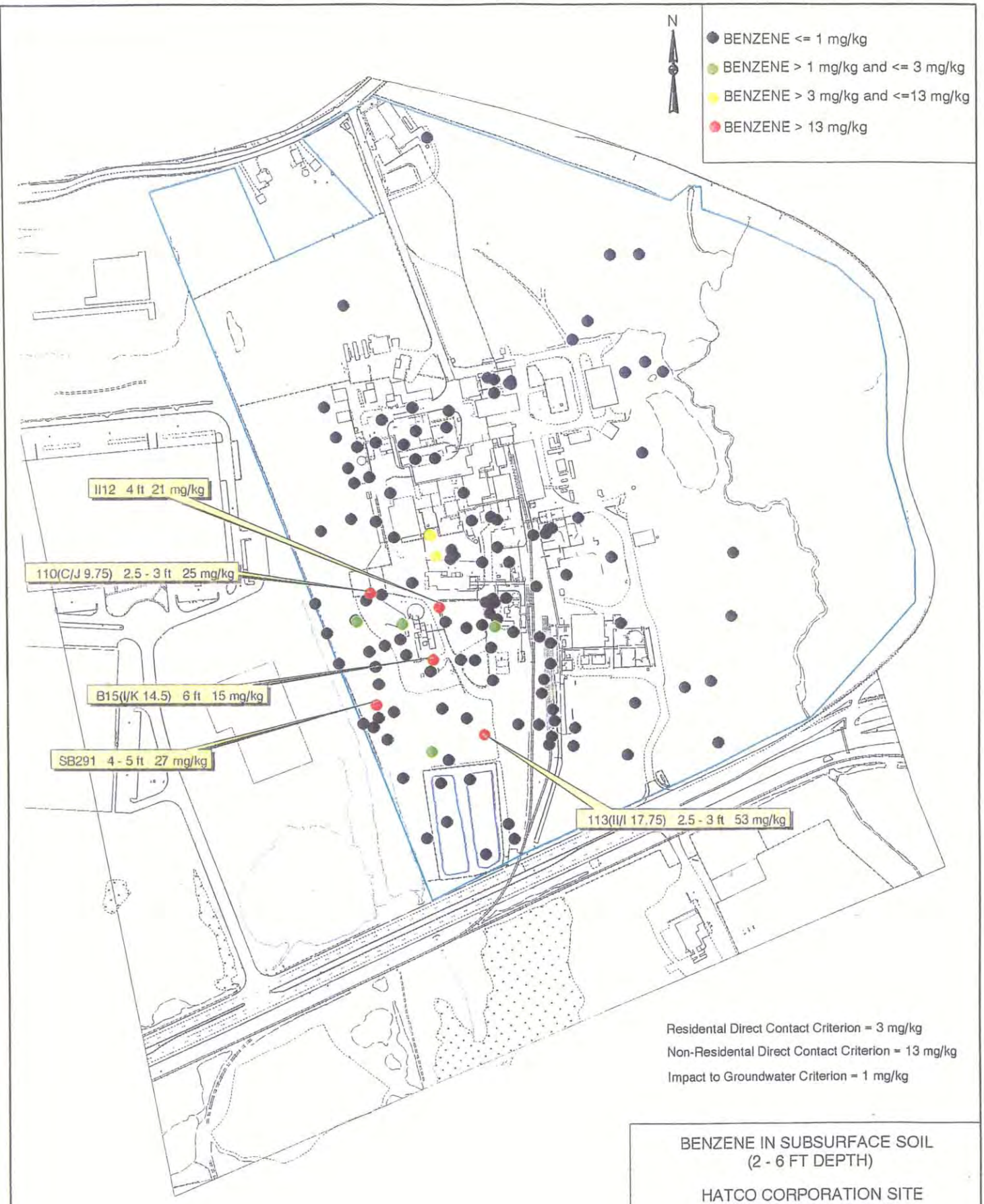


BENZENE IN SURFACE SOIL
(0 - 2 FT DEPTH)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 7, 2001		FIG. NO. E-1

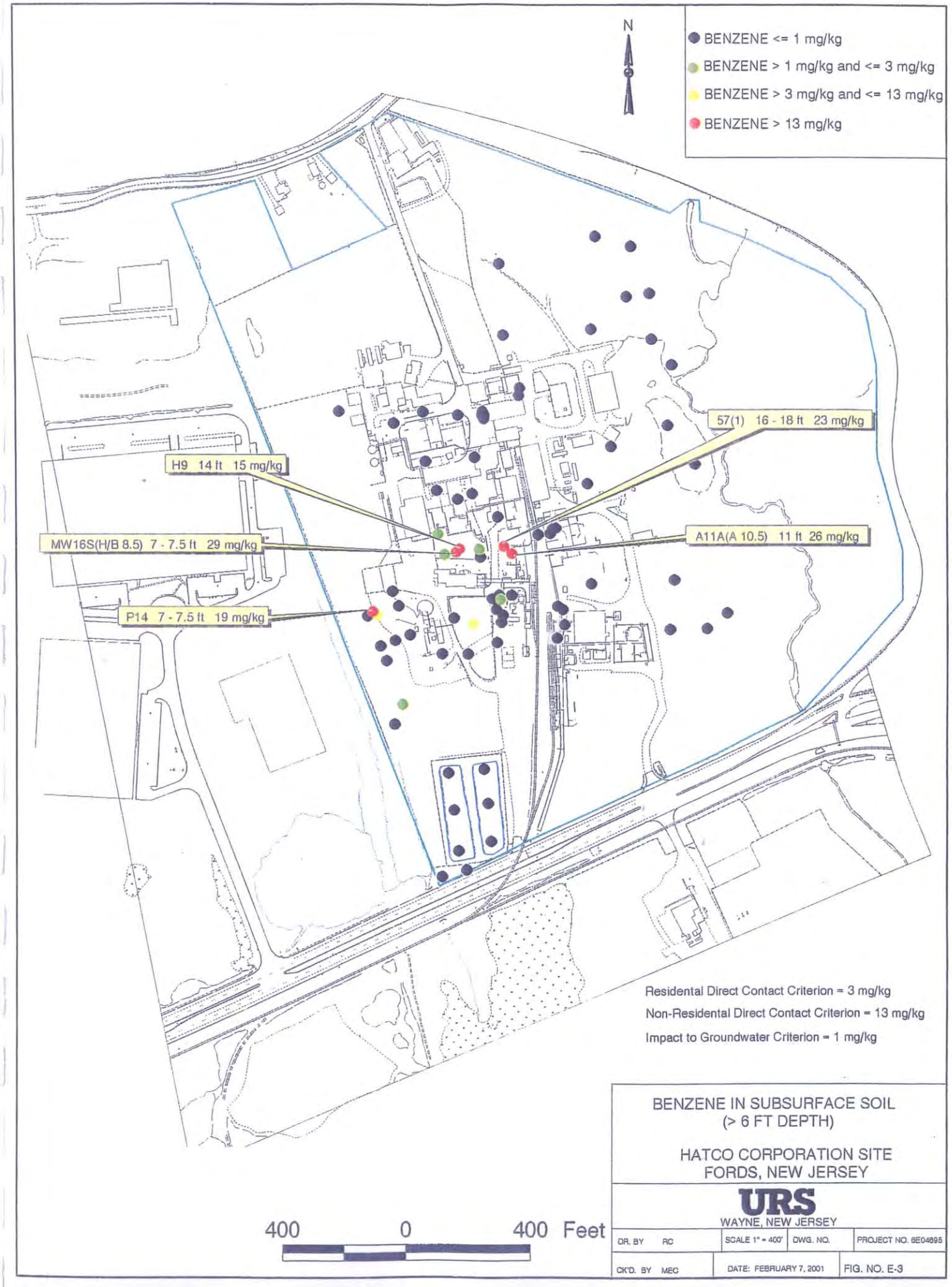


BENZENE IN SUBSURFACE SOIL
(2 - 6 FT DEPTH)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 7, 2001		FIG. NO. E-2



BENZENE IN SUBSURFACE SOIL
(> 6 FT DEPTH)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 7, 2001		FIG. NO. E-3

N

- BEHP <= 49 ppm
- BEHP > 49 ppm and <= 100 ppm
- BEHP > 100 ppm and <= 210 ppm
- BEHP > 210 ppm

G4.25 0 - 0.5 ft 230 mg/kg
K3.75 0 - 0.5 ft 530 mg/kg
H5 0 - 0.5 ft 310 mg/kg
G6 0 - 0.5 ft 470 mg/kg
B6 0 - 0.5 ft 1400 mg/kg
C5 1.5 - 2 ft 220 mg/kg
105(H/B 7.75) 0 - 0.5 ft 440 mg/kg
MW19S(F/G 9.5) 1.5 - 2 ft 360 mg/kg
B8 1.5 - 2 ft 510 mg/kg
H9 1.5 - 2 ft 240 mg/kg
MW16D(H 9.5) 1.5 - 2 ft 4000 mg/kg
H10 1.5 - 2 ft 1800 mg/kg
B17(H/B 9.5) 0.5 - 1 ft 1200 mg/kg
B17(H/B 9.5) 1.5 - 2 ft 580 mg/kg
B17(H/B 9.5) 0.5 - 1 ft 230 mg/kg
H0.75-12.75 0 - 0.5 ft 970 mg/kg
110(C/J 9.75) 1.5 - 2 ft 540 mg/kg
G13 0 - 0.5 ft 290 mg/kg
J10 1.5 - 2 ft 230 mg/kg
D13 1.5 - 2 ft 11000 mg/kg
C10 1.5 - 2 ft 450 mg/kg
TP29(J/L 15.75) 1 - 2 ft 8300 mg/kg
M13 1.5 - 2 ft 940 mg/kg
K13 1.5 - 2 ft 3400 mg/kg
203(J/L 18.75) 0 - 0.5 ft 110000 mg/kg
B13(M/D 16.25) 1.5 - 2 ft 400 mg/kg
B15(I/K 14.5) 1.5 - 2 ft 250 mg/kg
204(C/J 18.75) 0 - 0.5 ft 60000 mg/kg
204(C/J 18.75) 0 - 0.5 ft 42000 mg/kg
15 1.5 - 2 ft 1400 mg/kg
TP33(L/M 16.5) 0.5 - 1.5 ft 14000 mg/kg
SB208 1.5 - 2 ft 360 mg/kg
SB208 1.5 - 2 ft 350 mg/kg
SB208 0 - 0.5 ft 310 mg/kg
201(L/M 20.25) 0 - 0.5 ft 84000 mg/kg
HB1-6COMP 0.5 - 1 ft 420 mg/kg
HB1-6COMP 1.5 - 2 ft 280 mg/kg
HB1-6COMP 0 - 0.5 ft 220 mg/kg
202(J/L 20.5) 0 - 0.5 ft 62000 mg/kg
206(I/K 20.5) 0 - 0.5 ft 130000 mg/kg
HB7-12COMP 0 - 0.5 ft 1100 mg/kg
HB7-12COMP 0.5 - 1 ft 560 mg/kg
208(I/K 19) 0 - 0.5 ft 94000 mg/kg
207(K 19) 0 - 0.5 ft 75000 mg/kg
113(II/I 17.75) 0 - 0.5 ft 280 mg/kg
SB214 0 - 0.5 ft 4300 mg/kg
A/F 19 0.5 ft 9600 mg/kg
S/T32 1.5 - 2 ft 700 mg/kg
S/T31.75 1.5 - 2 ft 540 mg/kg
RR8 1 - 1.5 ft 2100 mg/kg
RR8 0 - 0.5 ft 400 mg/kg
TP29(J/L 15.75) 1 - 2 ft 8300 mg/kg
RR7 0 - 0.5 ft 6000 mg/kg
RR7 1 - 1.5 ft 3400 mg/kg
SE1(HH/A 17.25) 0.5 ft 43000 mg/kg
A0.5-17 0 - 0.5 ft 1100 mg/kg
H18.5 0.5 ft 5000 mg/kg
A0.75-15.75 0 - 0.5 ft 2000 mg/kg
RR3 0 - 0.5 ft 590 mg/kg
HH15.25 0.5 ft 2500 mg/kg
HH0.75-14.75 0 - 0.5 ft 420 mg/kg
143(CC/DD 13.5) 0 - 0.5 ft 27000 mg/kg
G14 1.5 - 2 ft 1000 mg/kg
GG0.75-12 0 - 0.5 ft 9200 mg/kg
GG0.5-12.75 0 - 0.5 ft 500 mg/kg
H0.75-13.5 0 - 0.5 ft 700 mg/kg
HH0.75-11.75 0 - 0.5 ft 11000 mg/kg
142(CC/DD 11.25) 0 - 0.5 ft 1300 mg/kg
GG12 0 - 0.5 ft 320 mg/kg
154(FF/E 10.5) 0 - 0.5 ft 5600 mg/kg
A9 0 - 0.5 ft 320 mg/kg
B18(F/G 10.25) 1.5 - 2 ft 2000 mg/kg
B18(F/G 10.25) 0.5 - 1 ft 1200 mg/kg
G0.25-13 0 - 0.5 ft 1400 mg/kg
E12 0 - 0.5 ft 310 mg/kg

Residential Direct Contact Criterion = 49 mg/kg

Non-Residential Direct Contact Criterion = 210 mg/kg

Impact to Groundwater Criterion = 100 mg/kg

300 0 300 Feet

BIS(2-ETHYLHEXYL)PHTHALATE
IN SURFACE SOIL (0 - 2 FT) DEPTH

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE: AS SHOWN	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 7, 2001	FIG. NO. E-4	

N

- BEHP <= 49 ppm
- BEHP > 49 ppm and <= 100 ppm
- BEHP > 100 ppm and <= 210 ppm
- BEHP > 210 ppm

SB211 4.5 - 5 ft 650 mg/kg
105(H/B 7.75) 5.5 - 6 ft 1300 mg/kg
105(H/B 7.75) 5.5 - 6 ft 1100 mg/kg
TP12(H/B 10.25) 5 - 6 ft 1700 mg/kg
B9 6 ft 490 mg/kg
57(19) 1 - 3 ft 1200 mg/kg
SB274 5 - 6 ft 1400 mg/kg
SB265 5.5 - 6 ft 410 mg/kg
SB279 4 - 6 ft 640 mg/kg
MW16D(H 9.5) 2 - 3 ft 1200 mg/kg
G6 4 ft 320 mg/kg
G9 2 - 2.5 ft 1200 mg/kg
H12 6 ft 390 mg/kg
H9 6 ft 1000 mg/kg
E10 4 ft 1600 mg/kg
TP11(H/B 10) 5 - 6 ft 53000 mg/kg
C8 2 - 2.5 ft 310 mg/kg
C8 2 - 2.5 ft 230 mg/kg
B18(F/G 10.25) 2.5 - 3 ft 540 mg/kg
HH0.75-11.75 3 - 3.5 ft 1300 mg/kg
SB302 5.5 - 6 ft 1100 mg/kg
GG0.75-12 3 - 3.5 ft 410 mg/kg
158(B/II 12.5) 4.5 - 5 ft 14000 mg/kg
II13 6 ft 290 mg/kg
C10 6 ft 330 mg/kg
H0.75-13.5 4 - 4.5 ft 600 mg/kg
L9 4 ft 1700 mg/kg
G14 6 ft 1200 mg/kg
H14 6 ft 7100 mg/kg
J10 6 ft 220 mg/kg
H0.75-14.25 3 - 3.5 ft 910 mg/kg
II12 4 ft 410 mg/kg
H15 4 ft 980 mg/kg
H15 6 ft 670 mg/kg
SB296 4.5 - 6 ft 220 mg/kg
C11 6 ft 690 mg/kg
P13 5.5 - 6 ft 20000 mg/kg
SB286 5 - 6 ft 18000 mg/kg
TP20(H/B 15.25) 4 - 5 ft 900 mg/kg
SB287 5.5 - 6 ft 14000 mg/kg
TP19(H/B 15.25) 4 - 5 ft 350 mg/kg
C13 6 ft 520 mg/kg
B16(B/II 15.25) 4 ft 420 mg/kg
L13 2 - 2.5 ft 1000 mg/kg
L13 2 - 2.5 ft 650 mg/kg
RR9 2 - 2.5 ft 310 mg/kg
II14 6 ft 13000 mg/kg
117(R/S 31.75) 2.5 - 3 ft 1100 mg/kg
L14 6 ft 540 mg/kg
TP15(II/I 14) 4 - 5 ft 3000 mg/kg
A/F 19 6 ft 2400 mg/kg
D14 6 ft 410 mg/kg
TP32(M 15.75) 4.5 ft 34000 mg/kg
TP38(L/M 14.25) 4 ft 7000 mg/kg
SB292 5 - 5.5 ft 2400 mg/kg
TP24(II/I 16.5) 4 ft 260 mg/kg
TP18(K/C 14.25) 3 - 4 ft 22000 mg/kg
SB291 4 - 5 ft 10000 mg/kg
L16 4 ft 360 mg/kg
SB219 2 - 2.5 ft 470 mg/kg
TP26(M/D 14.75) 5 - 6 ft 1100 mg/kg
HB10 4 - 4.5 ft 960 mg/kg
TP39(D 16.25) 2.5 - 3 ft 1200 mg/kg
B15(I/K 14.5) 4 ft 760 mg/kg
B15(I/K 14.5) 3.5 - 4 ft 660 mg/kg
B15(I/K 14.5) 6 ft 300 mg/kg
114(C/J 17.5) 5 - 5.5 ft 620 mg/kg
M16 4 ft 3000 mg/kg
TP2A 2 - 2.5 ft 490 mg/kg
B13(M/D 16.25) 4 ft 2500 mg/kg

Residential Direct Contact Criterion = 49 mg/kg

Non-Residential Direct Contact Criterion = 210 mg/kg

Impact to Groundwater Criterion = 100 mg/kg

0 300 Feet

BIS(2-ETHYLHEXYL)PHTHALATE IN SUBSURFACE SOIL (2 - 6 FT) DEPTH

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE: AS SHOWN	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 7, 2001	FIG. NO. E-5	

N

- BEHP <= 49 ppm
- BEHP > 49 ppm and <= 100 ppm
- BEHP > 100 ppm and <= 210 ppm
- BEHP > 210 ppm

S-11 8 - 10 ft 270 mg/kg
SB279 13.5 - 14.5 ft 3800 mg/kg
H9 12 ft 1600 mg/kg
H9 10 ft 1500 mg/kg
H9 14 ft 1100 mg/kg
57(19) 9 - 11 ft 2700 mg/kg
MW19S(F/G 9.5) 9 - 9.5 ft 1300 mg/kg
MW16S(H/B 8.5) 7 - 7.5 ft 85000 mg/kg
MW37S 14 - 14.5 ft 450 mg/kg
SB211 9 - 10 ft 770 mg/kg
SB211 11.5 - 12 ft 350 mg/kg
57(1) 16 - 18 ft 4300 mg/kg
TP6(F/G 10.5) 9 - 10 ft 2000 mg/kg
TP1(H 8.5) 10 - 11 ft 1000 mg/kg
TP8(G 11.25) 8 - 9 ft 1000 mg/kg
TP8(G 11.25) 8 - 9 ft 1000 mg/kg
TP3(H 8.75) 8 - 9 ft 14000 mg/kg
SB274 11.5 - 12 ft 3200 mg/kg
G0.25-12.75 6 - 6.5 ft 870 mg/kg
L8 8 ft 480 mg/kg
SB275 9.5 - 10 ft 2600 mg/kg
G0.25-13 8 - 8.5 ft 560 mg/kg
J10 10 ft 420 mg/kg
J10 8 ft 350 mg/kg
H0.75-13.5 6 - 6.5 ft 1100 mg/kg
H0.75-13.5 8 - 8.5 ft 590 mg/kg
C10 8 ft 460 mg/kg
A0.75-15.75 7 - 7.5 ft 450 mg/kg
P14 7 - 7.5 ft 9400 mg/kg
SB212 9.5 - 10 ft 4000 mg/kg
MW17S(J/L 11.75) 9.5 - 10 ft 1500 mg/kg
C11 8 ft 410 mg/kg
TP25(D 14.75) 9 - 10 ft 740 mg/kg
B13(M/D 16.25) 8 ft 1500 mg/kg
B13(M/D 16.25) 10 ft 290 mg/kg
TP41(C/J 13.75) 5 - 7 ft 6200 mg/kg
M16 8 ft 790 mg/kg
SB219 6.5 - 7 ft 240 mg/kg
TP10(H/B 9.25) 7 - 8 ft 15000 mg/kg
B9 10 ft 1000 mg/kg
B9 12 ft 330 mg/kg
TP9(B 9.25) 10 - 11 ft 1000 mg/kg

00 0 300 Feet

Residential Direct Contact Criterion = 49 mg/kg

Non-Residential Direct Contact Criterion = 210 mg/kg

Impact to Groundwater Criterion = 100 mg/kg

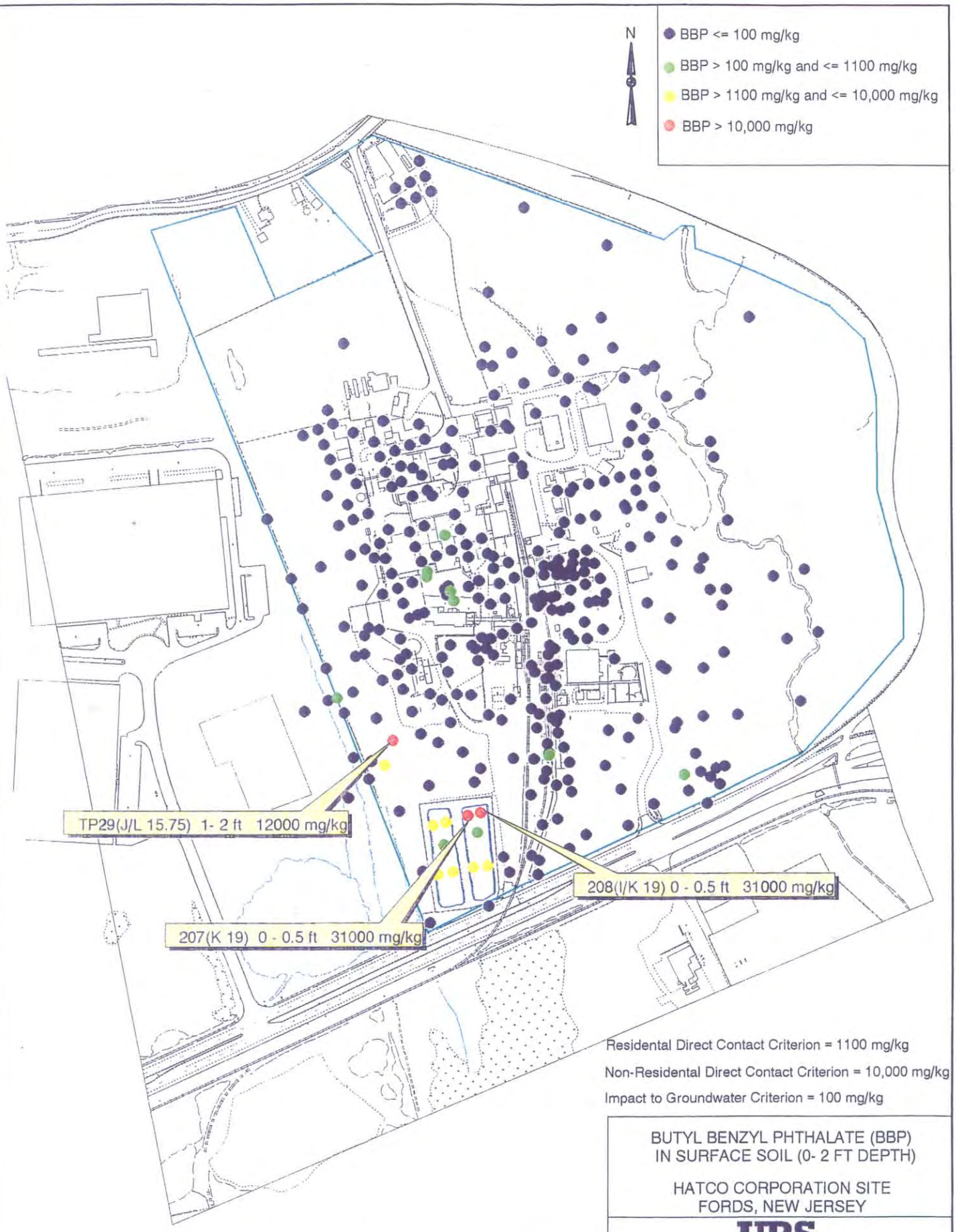
BIS(2-ETHYLHEXYL)PHTHALATE IN SUBSURFACE SOIL (> 6 FT) DEPTH

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE: AS SHOWN	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 7, 2001	FIG. NO. E-6	



Residental Direct Contact Criterion = 1100 mg/kg

Non-Residental Direct Contact Criterion = 10,000 mg/kg

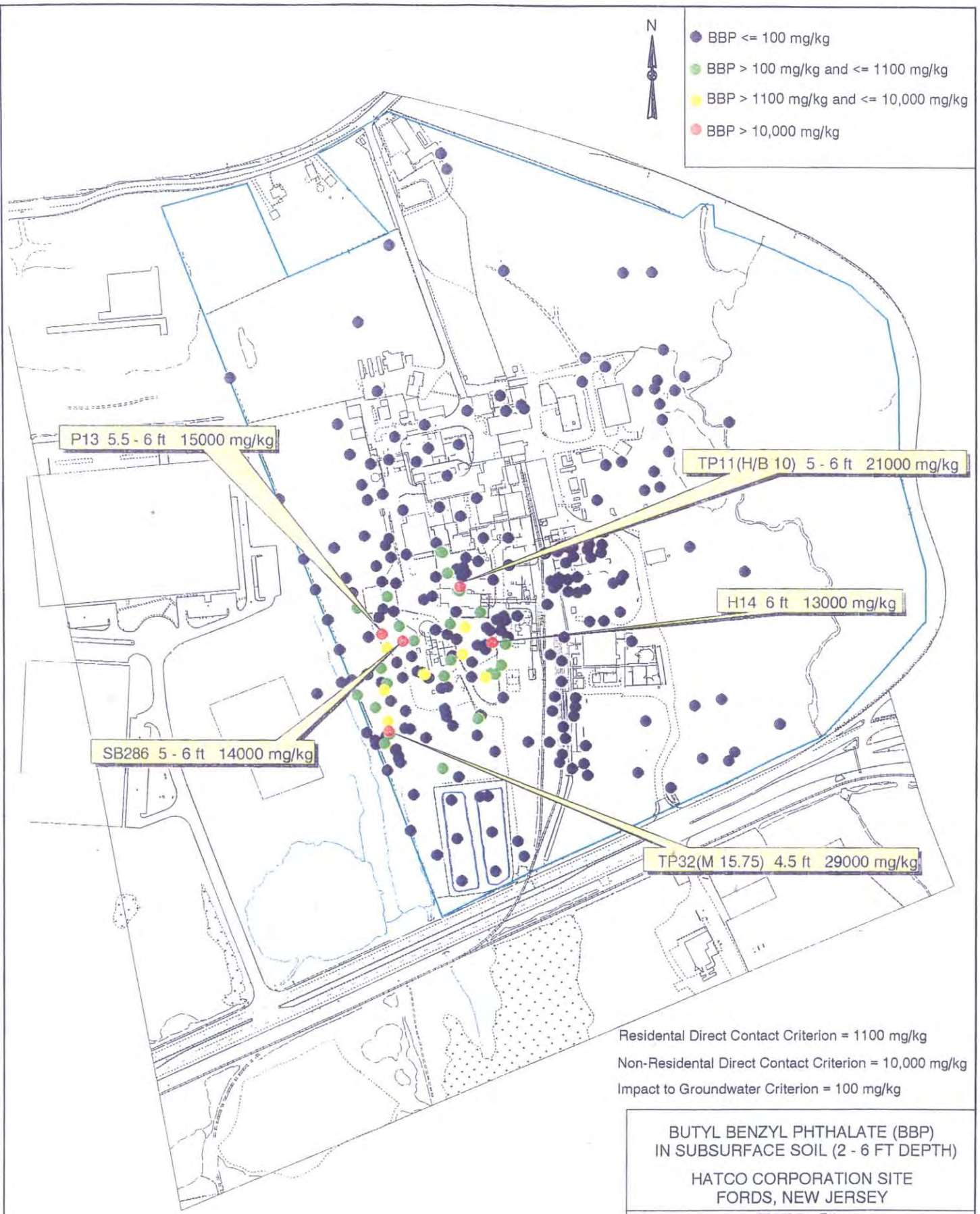
Impact to Groundwater Criterion = 100 mg/kg

BUTYL BENZYL PHTHALATE (BBP)
IN SURFACE SOIL (0- 2 FT DEPTH)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 7, 2001		FIG. NO. E-7



Residental Direct Contact Criterion = 1100 mg/kg

Non-Residental Direct Contact Criterion = 10,000 mg/kg

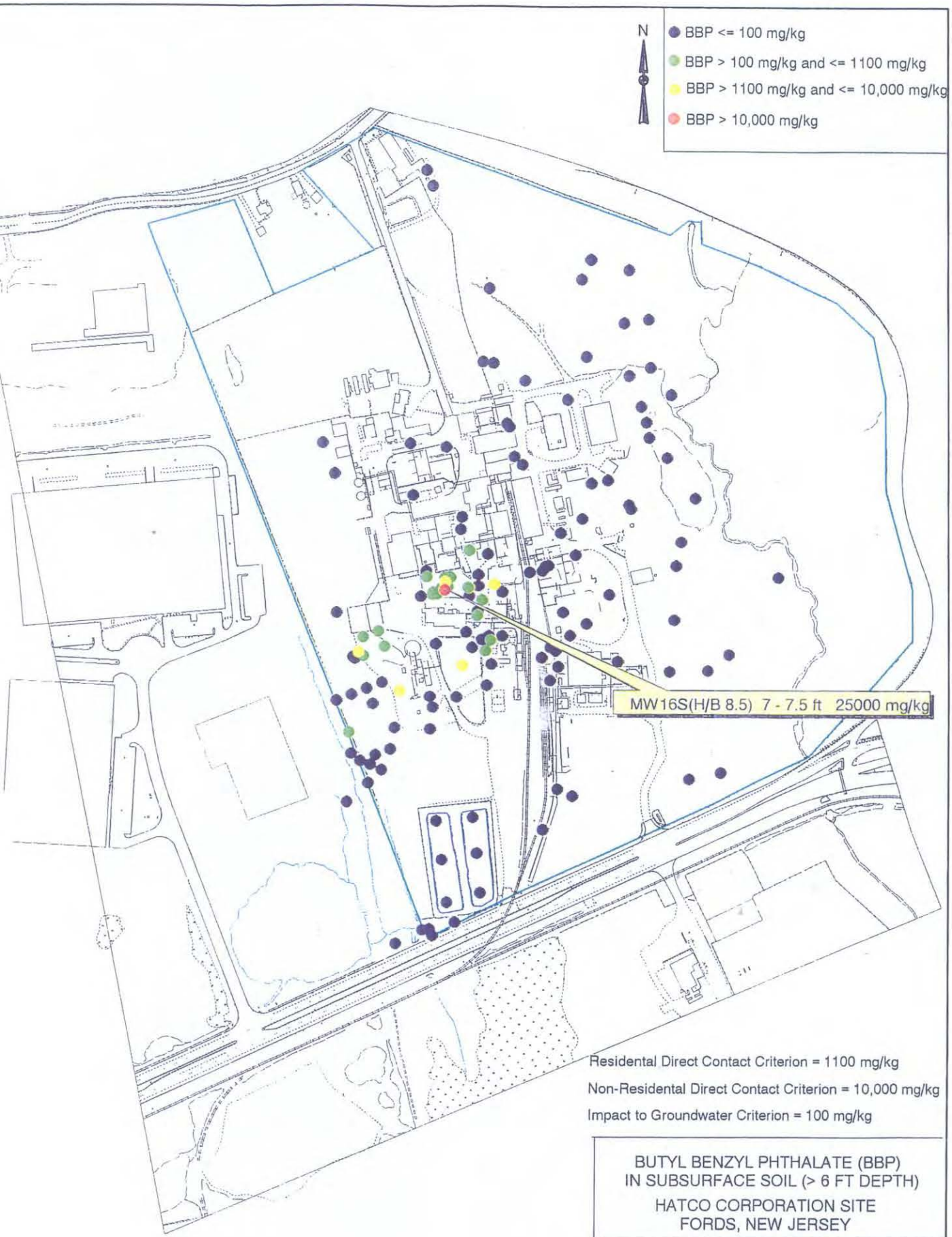
Impact to Groundwater Criterion = 100 mg/kg

BUTYL BENZYL PHTHALATE (BBP)
IN SUBSURFACE SOIL (2 - 6 FT DEPTH)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: FEBRUARY 7, 2001		FIG. NO. E-8



Residental Direct Contact Criterion = 1100 mg/kg

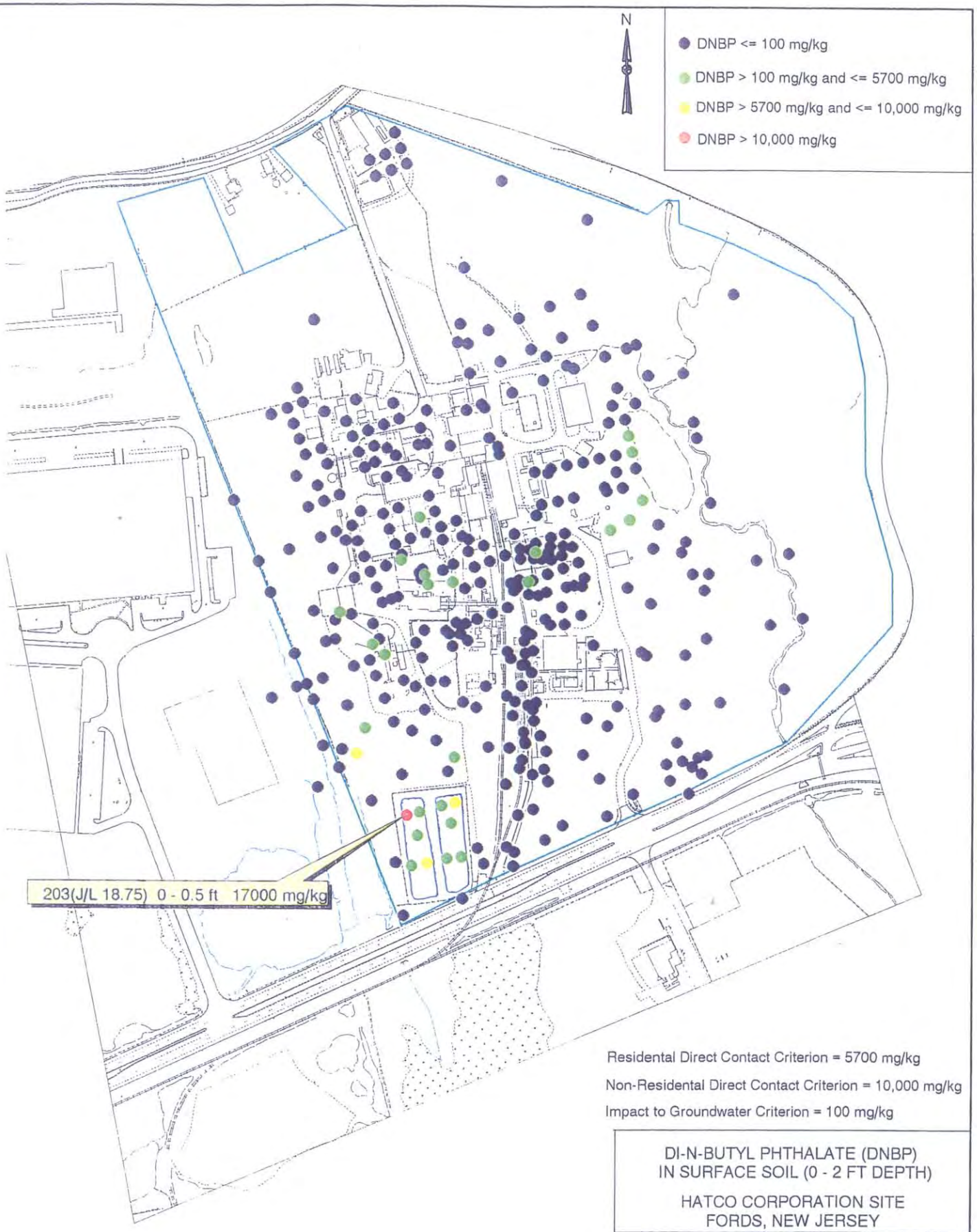
Non-Residental Direct Contact Criterion = 10,000 mg/kg

Impact to Groundwater Criterion = 100 mg/kg

BUTYL BENZYL PHTHALATE (BBP)
IN SUBSURFACE SOIL (> 6 FT DEPTH)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 7, 2001		FIG. NO. E-9



Residental Direct Contact Criterion = 5700 mg/kg

Non-Residental Direct Contact Criterion = 10,000 mg/kg

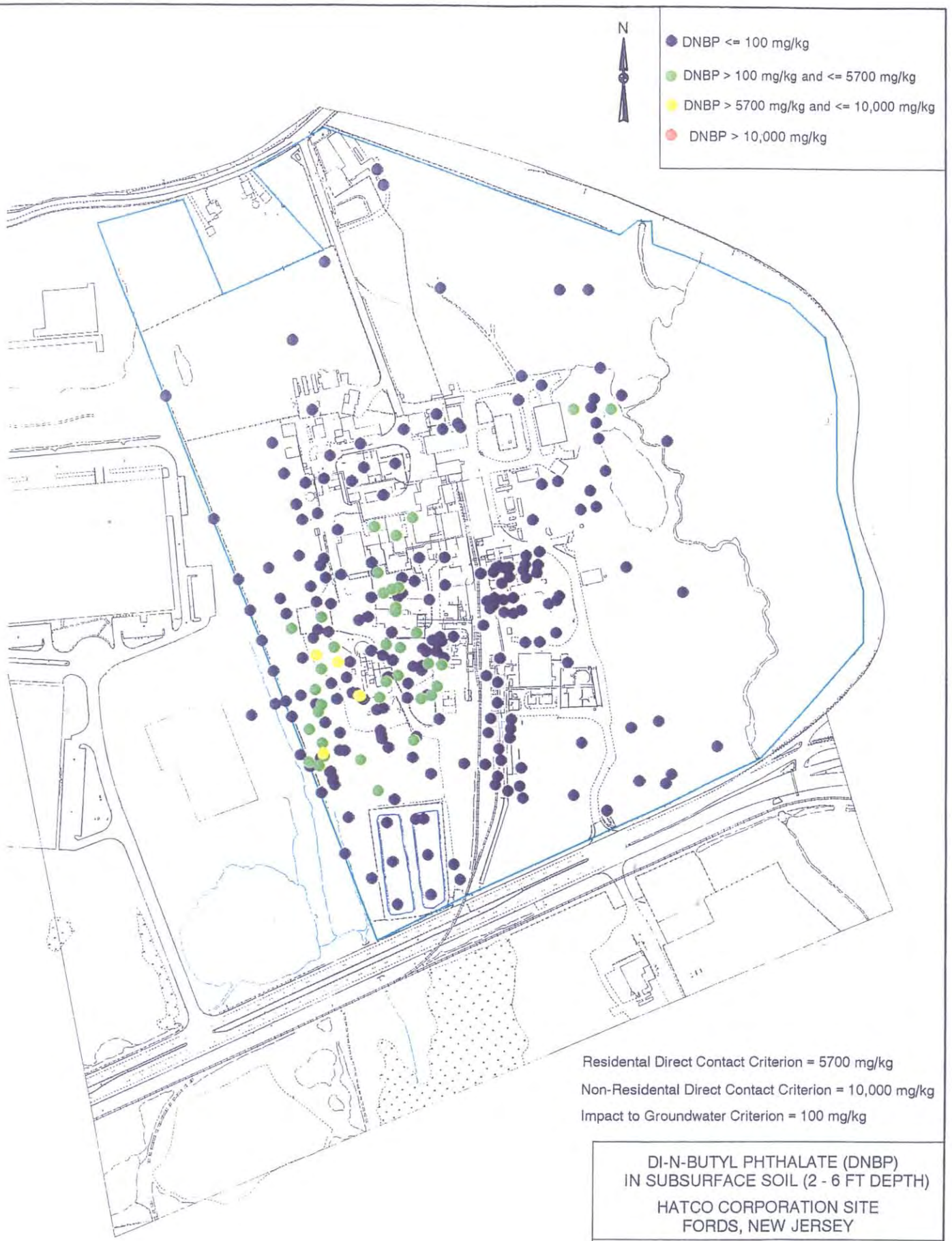
Impact to Groundwater Criterion = 100 mg/kg

DI-N-BUTYL PHTHALATE (DNBP)
IN SURFACE SOIL (0 - 2 FT DEPTH)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 7, 2001	FIG. NO. E-10	



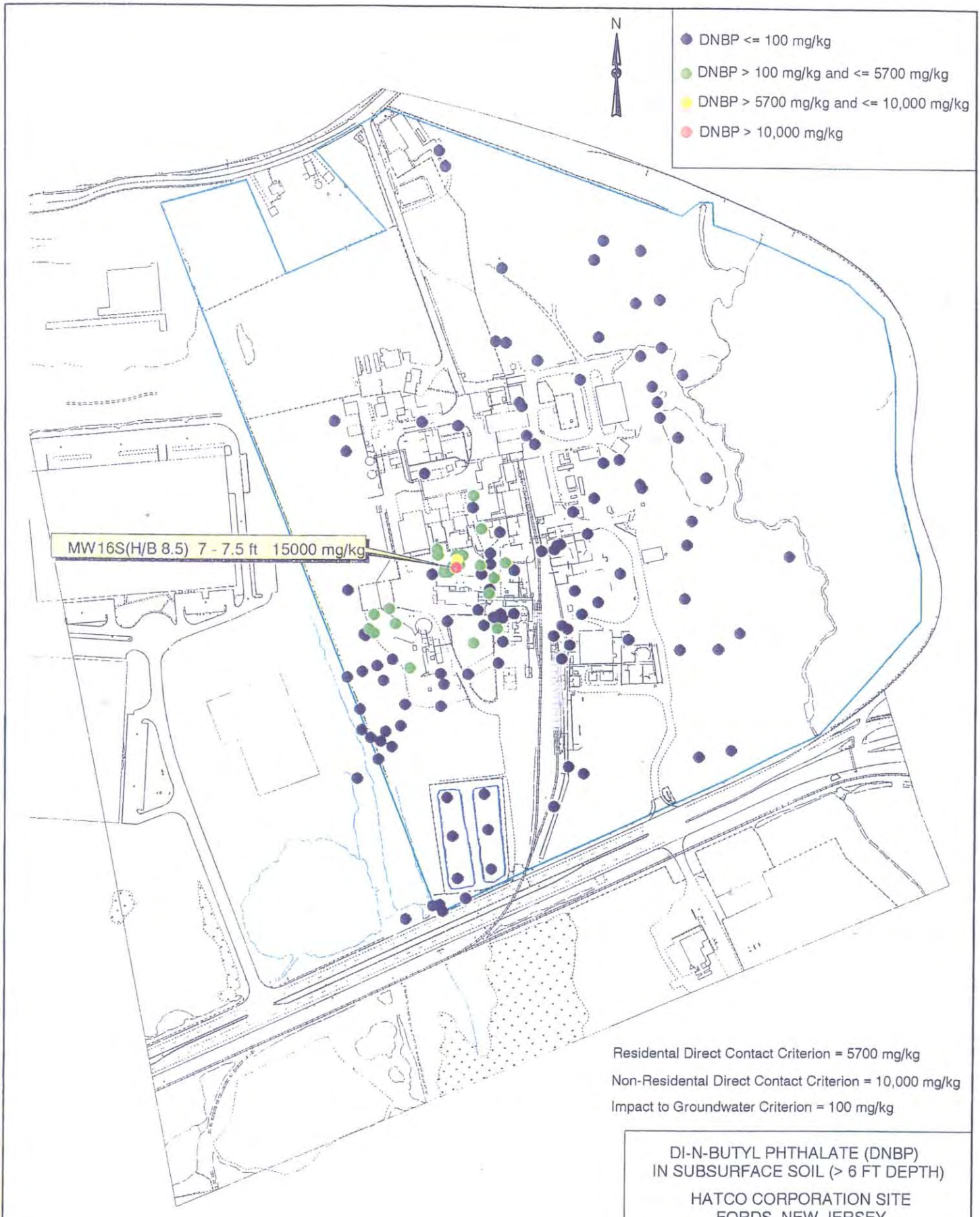
DI-N-BUTYL PHTHALATE (DNBP) IN SUBSURFACE SOIL (2 - 6 FT DEPTH)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 7, 2001	FIG. NO. E-11	

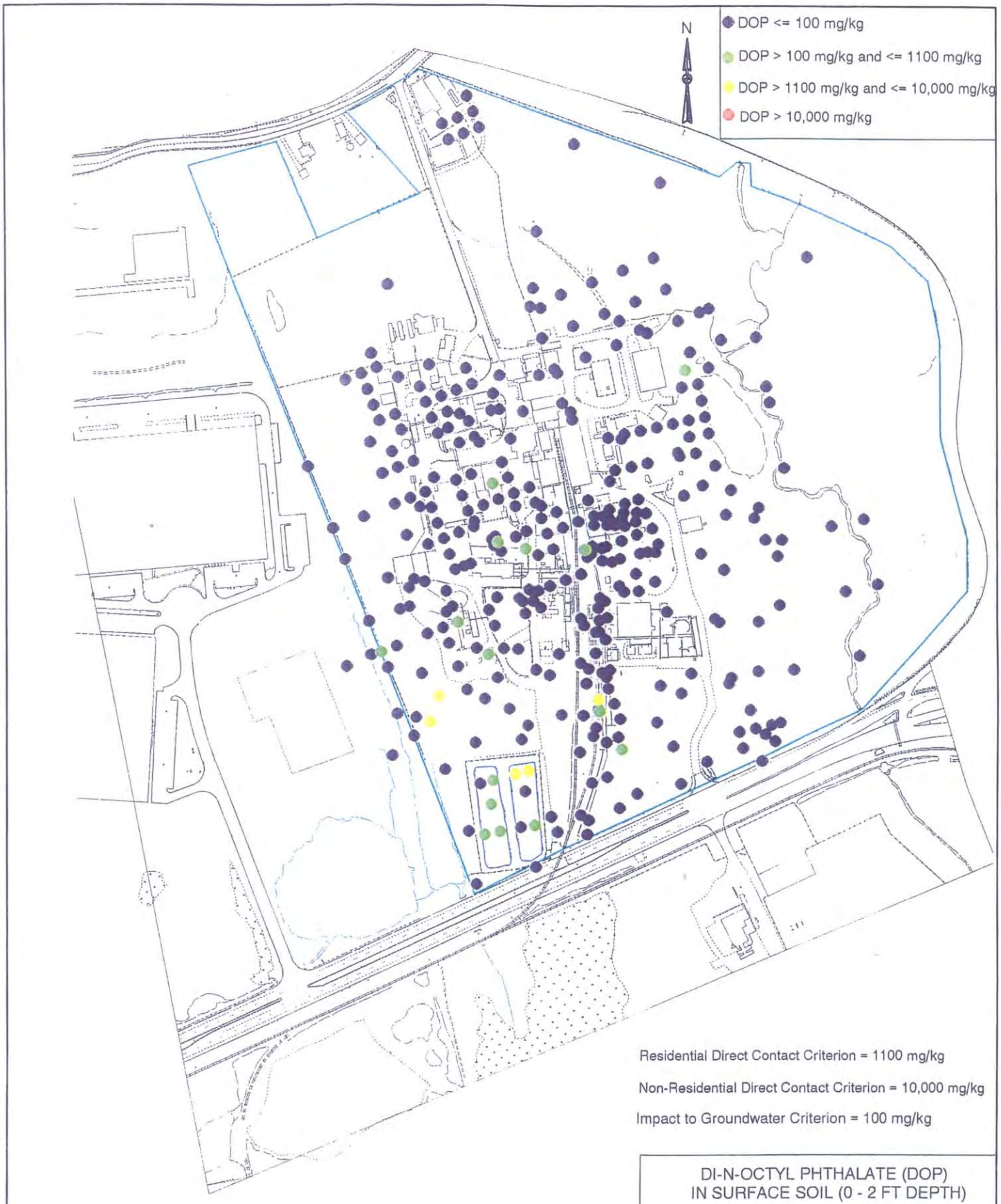


DI-N-BUTYL PHTHALATE (DNBP)
IN SUBSURFACE SOIL (> 6 FT DEPTH)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: FEBRUARY 7, 2001		FIG. NO. E-12

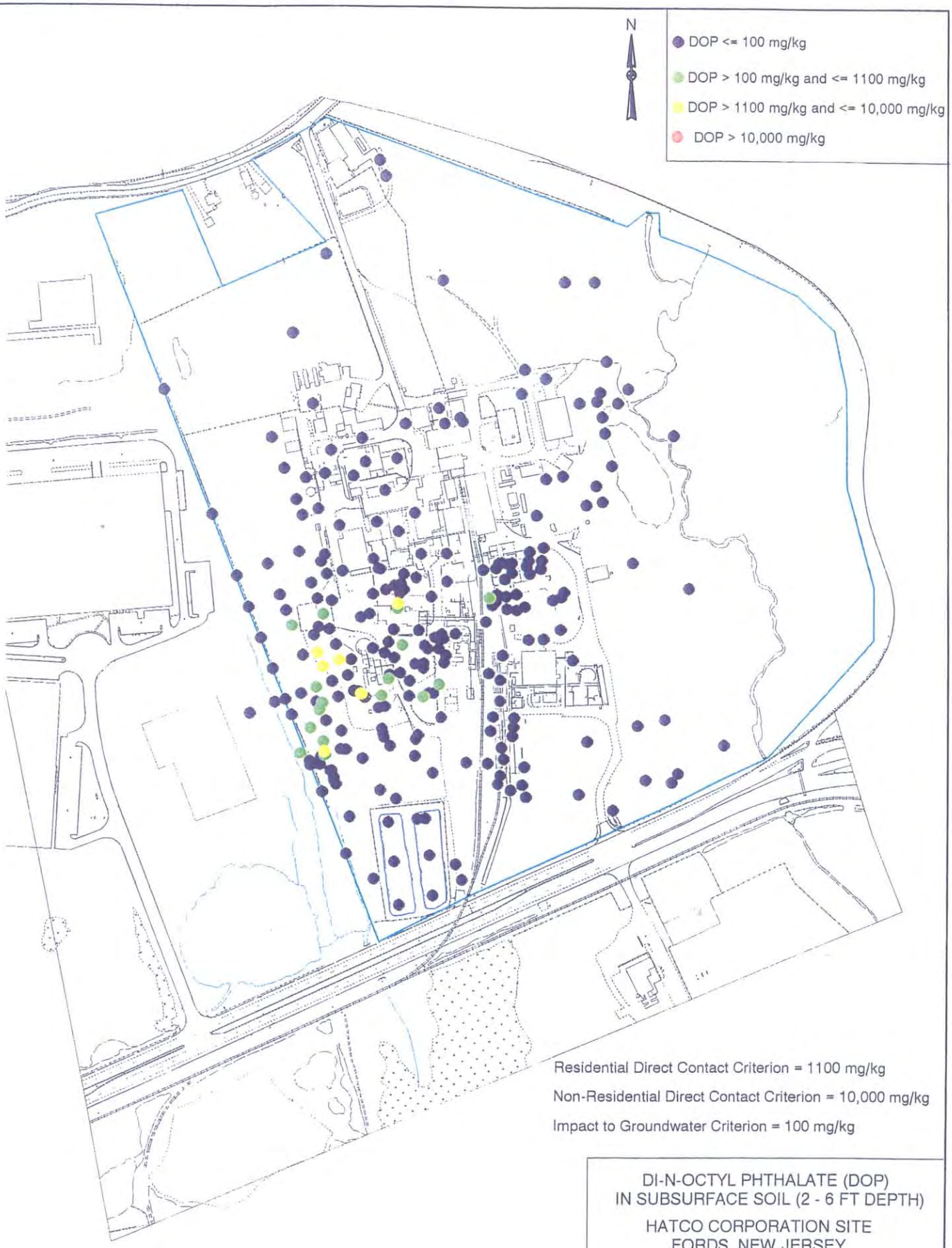


DI-N-OCTYL PHTHALATE (DOP)
IN SURFACE SOIL (0 - 2 FT DEPTH)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 7, 2001	FIG. NO. E-13	

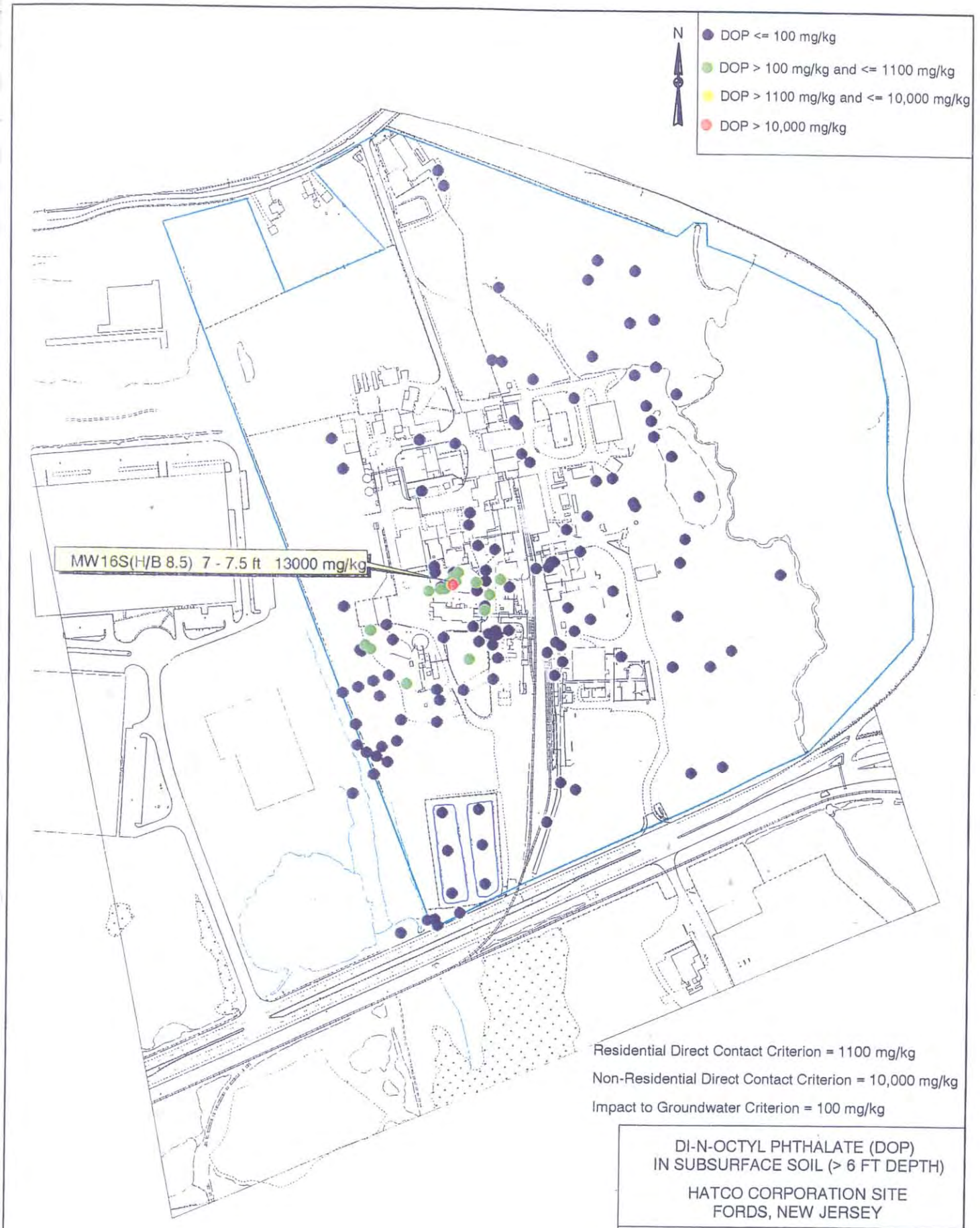


DI-N-OCTYL PHTHALATE (DOP)
IN SUBSURFACE SOIL (2 - 6 FT DEPTH)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: FEBRUARY 7, 2001	FIG. NO. E-14	

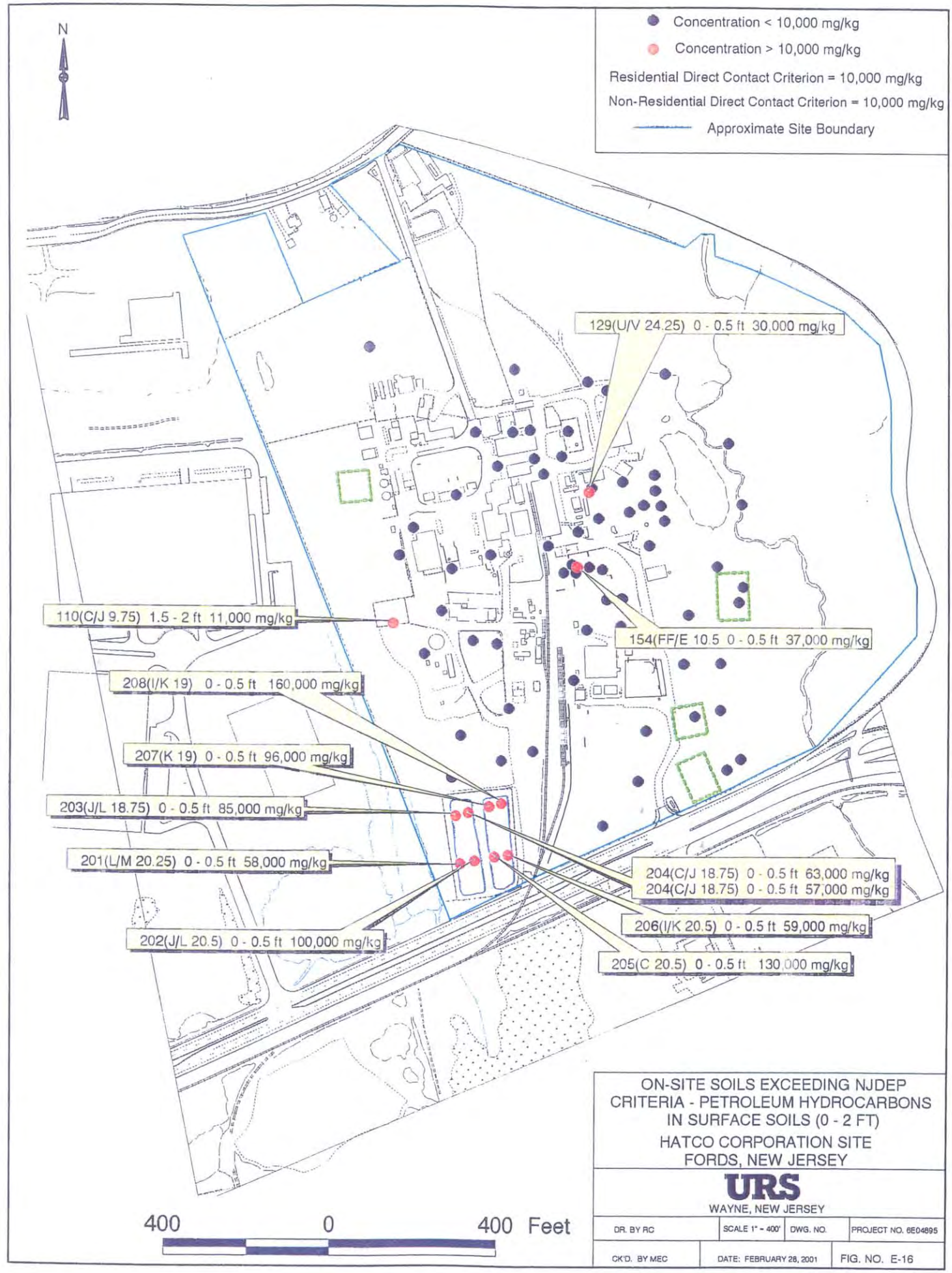


DI-N-OCTYL PHTHALATE (DOP)
IN SUBSURFACE SOIL (> 6 FT DEPTH)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: FEBRUARY 7, 2001		FIG. NO. E-15

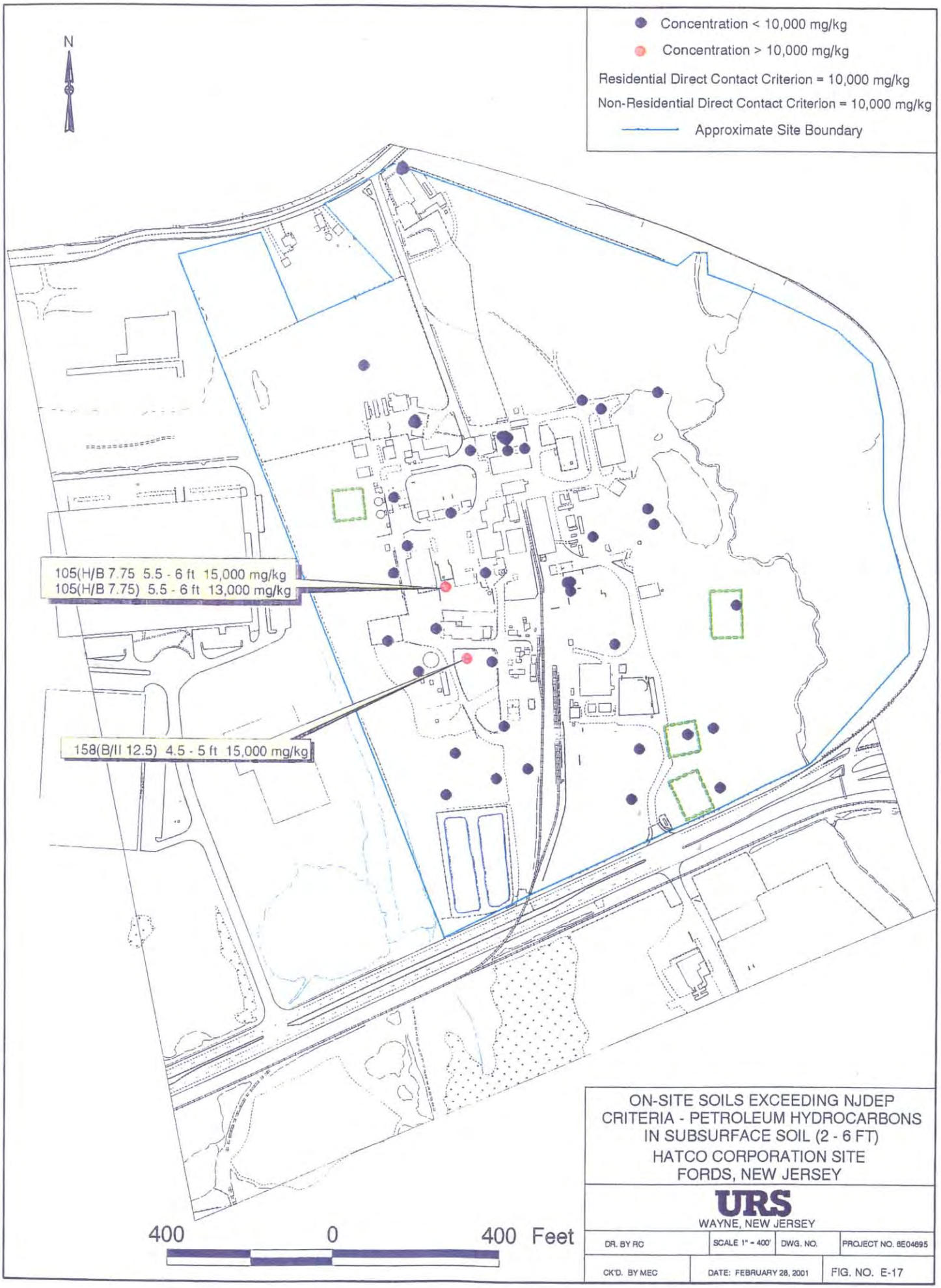


ON-SITE SOILS EXCEEDING NJDEP CRITERIA - PETROLEUM HYDROCARBONS IN SURFACE SOILS (0 - 2 FT)

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: FEBRUARY 28, 2001		FIG. NO. E-16



ON-SITE SOILS EXCEEDING NJDEP CRITERIA - PETROLEUM HYDROCARBONS IN SUBSURFACE SOIL (2 - 6 FT)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04695
CK'D. BY MEC	DATE: FEBRUARY 28, 2001	FIG. NO. E-17	

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - PETROLEUM HYDROCARBONS IN SUBSURFACE SOIL (> 6 FT)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 28, 2001	FIG. NO. E-18	

N

- PCBs <= 0.49 ppm
- PCBs > 0.49 ppm and <= 2 ppm
- PCBs > 2 ppm and <= 100 ppm
- PCBs > 100 ppm

A9 0 - 0.5 ft 140 mg/kg
MW19S(F/G 9.5) 1.5 - 2 ft 243 mg/kg
MW16D(H 9.5) 1.5 - 2 ft 151 mg/kg
B17(B)(H/B 9.5) 1.5 - 2 ft 180 mg/kg
B17 0 - 0.5 ft 150 mg/kg
B17(A)(H/B 9.5) 0.5 - 1 ft 150 mg/kg
B17(B)(H/B 9.5) 0.5 - 1 ft 140 mg/kg
H10 0 - 0.5 ft 440 mg/kg
L9 0 - 0.5 ft 160 mg/kg
K10 0 - 0.5 ft 170 mg/kg
L11 0 - 0.5 ft 660 mg/kg
D13 1.5 - 2 ft 760 mg/kg
J11 0 - 0.5 ft 400 mg/kg
M13 1.5 - 2 ft 330 mg/kg
L13 0 - 0.5 ft 120 mg/kg
B13(M/D 16.25) 1.5 - 2 ft 1800 mg/kg
M14 0 - 0.5 ft 430 mg/kg
B14(L/M 14.75) 0.5 - 1 ft 960 mg/kg
C14 0 - 0.5 ft 140 mg/kg
TP33(L/M 16.5) 0.5 - 1.5 ft 4900 mg/kg
203(J/L 18.75) 0 - 0.5 ft 120 mg/kg
201(L/M 20.25) 0 - 0.5 ft 300 mg/kg
202(J/L 20.5) 0 - 0.5 ft 510 mg/kg
SB422 1.5 - 2 ft 880 mg/kg
206(I/K 20.5) 0 - 0.5 ft 150 mg/kg
204(B)(C/J 18.75) 0 - 0.5 ft 320 mg/kg
204(A)(C/J 18.75) 0 - 0.5 ft 260 mg/kg
207(K 19) 0 - 0.5 ft 300 mg/kg
208(I/K 19) 0 - 0.5 ft 300 mg/kg
L16 0 - 0.5 ft 400 mg/kg
TP29(J/L 15.75) 1 - 2 ft 510 mg/kg
H16.5 0.5 ft 150 mg/kg
K13 0 - 0.5 ft 420 mg/kg
J12 0 - 0.5 ft 102 mg/kg
F11 0 - 0.5 ft 310 mg/kg
F11 0 - 0.5 ft 310 mg/kg
A11 0 - 0.5 ft 110 mg/kg
A11 0 - 0.5 ft 110 mg/kg
B18 0 - 0.5 ft 110 mg/kg
F10 0.5 ft 260 mg/kg
G10 0 - 0.5 ft 130 mg/kg

300 0 300 Feet

Residential Direct Contact Criterion = 0.49 mg/kg

Non-Residential Direct Contact Criterion = 2 mg/kg

Impact to Groundwater Criterion = 100 mg/kg

TOTAL PCBS IN SURFACE SOIL (0 - 2 FT) DEPTH

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE: AS SHOWN	DWG NO.	PROJECT NO. 6E04695
CKD. BY MEC	DATE: FEBRUARY 7, 2001		FIG. NO. E-19

N

- PCBs <= 0.49 ppm
- PCBs > 0.49 ppm and <= 2 ppm
- PCBs > 2 ppm and <= 100 ppm
- PCBs > 100 ppm

G9 2 - 2.5 ft 340 mg/kg
SB211 4.5 - 5 ft 290 mg/kg
H9 6 ft 150 mg/kg
SB274 5 - 6 ft 530 mg/kg
SB276 5.5 - 6 ft 500 mg/kg
SB265 5.5 - 6 ft 359 mg/kg
TP11(H/B 10) 5 - 6 ft 9500 mg/kg
C9 2 - 2.5 ft 500 mg/kg
C9 4 - 4.5 ft 240 mg/kg
L8 5 - 5.5 ft 240 mg/kg
SB262 5.25 - 5.75 ft 6700 mg/kg
SB262 5.25 - 5.75 ft 1600 mg/kg
J10 4 - 4.5 ft 12000 mg/kg
SB263 4 - 4.5 ft 2800 mg/kg
SB210 3 - 4 ft 170 mg/kg
SB210 3 - 4 ft 140 mg/kg
P13 5.5 - 6 ft 580 mg/kg
C11 6 ft 130 mg/kg
L13 4 - 4.5 ft 4500 mg/kg
SB288 4 - 4.5 ft 460 mg/kg
SB288 4 - 4.5 ft 330 mg/kg
SB290 4.5 - 5 ft 1200 mg/kg
M13 4 - 4.5 ft 2300 mg/kg
TP38(L/M 14.25) 4 ft 930 mg/kg
SB291 4 - 5 ft 1400 mg/kg
TP32(M 15.75) 4.5 ft 3200 mg/kg
TP2A 2 - 2.5 ft 170 mg/kg
B13(M/D 16.25) 2.5 - 3 ft 110 mg/kg
J13 4 - 4.5 ft 450 mg/kg
SB287 5.5 - 6 ft 140 mg/kg
H10 4 - 4.5 ft 350 mg/kg
H10 4 - 4.5 ft 250 mg/kg
SB307 3.25 - 4 ft 179 mg/kg
C10 4 - 4.5 ft 310 mg/kg
SB301 5.5 - 6 ft 278 mg/kg
SB303 5.5 - 6 ft 770 mg/kg
158(B/II 12.5) 4.5 - 5 ft 170 mg/kg
SB286 5 - 6 ft 2300 mg/kg
H14 6 ft 220 mg/kg
H14 4 ft 120 mg/kg
II14 6 ft 220 mg/kg
II14 4 ft 150 mg/kg
TP15(II/I 14) 4 - 5 ft 160 mg/kg
SB269 4 - 6 ft 240 mg/kg
C13 4 - 4.5 ft 160 mg/kg
C14 2.5 - 3 ft 280 mg/kg
B15 4 ft 380 mg/kg
B15 6 ft 300 mg/kg
TP18(K/C 14.25) 3 - 4 ft 2600 mg/kg
SB293 4 - 6 ft 510 mg/kg
SB270 5.5 - 6 ft 1100 mg/kg
J16.5 4 ft 120 mg/kg
147(H/B 17.75) 2.5 - 3 ft 195 mg

300 0 300 Feet

Residential Direct Contact Criterion = 0.49 mg/kg

Non-Residential Direct Contact Criterion = 2 mg/kg

Impact to Groundwater Criterion = 100 mg/kg

TOTAL PCBS IN SUBSURFACE SOIL (2 - 6 FT) DEPTH

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE: AS SHOWN	DWG NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 7, 2001		FIG. NO. E-20

N

- PCBs <= 0.49 ppm
- PCBs > 0.49 ppm and <= 2 ppm
- PCBs > 2 ppm and <= 100 ppm
- PCBs > 100 ppm

H9 12 ft 400 mg/kg
H9 10 ft 330 mg/kg
H9 14 ft 250 mg/kg

SB280 16.5 - 17 ft 2700 mg/kg

57(1) 16 - 18 ft 252 mg/kg

SB283 11.5 - 12 ft 280 mg/kg

MW19S(F/G 9.5) 9 - 9.5 ft 414 mg/kg

SB278 19 - 19.5 ft 2300 mg/kg
SB278 10 - 12 ft 170 mg/kg

MW16S(H/B 8.5) 7 - 7.5 ft 8600 mg/kg

SB303 7.5 - 8 ft 180 mg/kg

SB212 9.5 - 10 ft 5900 mg/kg

SB279 13.5 - 14.5 ft 410 mg/kg

TP1(H 8.5) 10 - 11 ft 200 mg/kg

K6 9.5 - 10 ft 120 mg/kg

TP3(H 8.75) 8 - 9 ft 8300 mg/kg

SB274 11.5 - 12 ft 890 mg/kg

TP10(H/B 9.25) 7 - 8 ft 1600 mg/kg

SB268 9 - 9.5 ft 130 mg/kg

SB267 9.5 - 10 ft 440 mg/kg

J10 10 ft 130 mg/kg

P14 7 - 7.5 ft 320 mg/kg

TP41(C/J 13.75) 5 - 7 ft 120 mg/kg

SB290 8.5 - 9 ft 530 mg/kg

B15 8 ft 120 mg/kg

SB291 8.5 - 9.5 ft 470 mg/kg

Residential Direct Contact Criterion = 0.49 mg/kg
Non-Residential Direct Contact Criterion = 2 mg/kg
Impact to Groundwater Criterion = 100 mg/kg

300 0 300 Feet

TOTAL PCBS IN SUBSURFACE SOIL (>6 FT) DEPTH

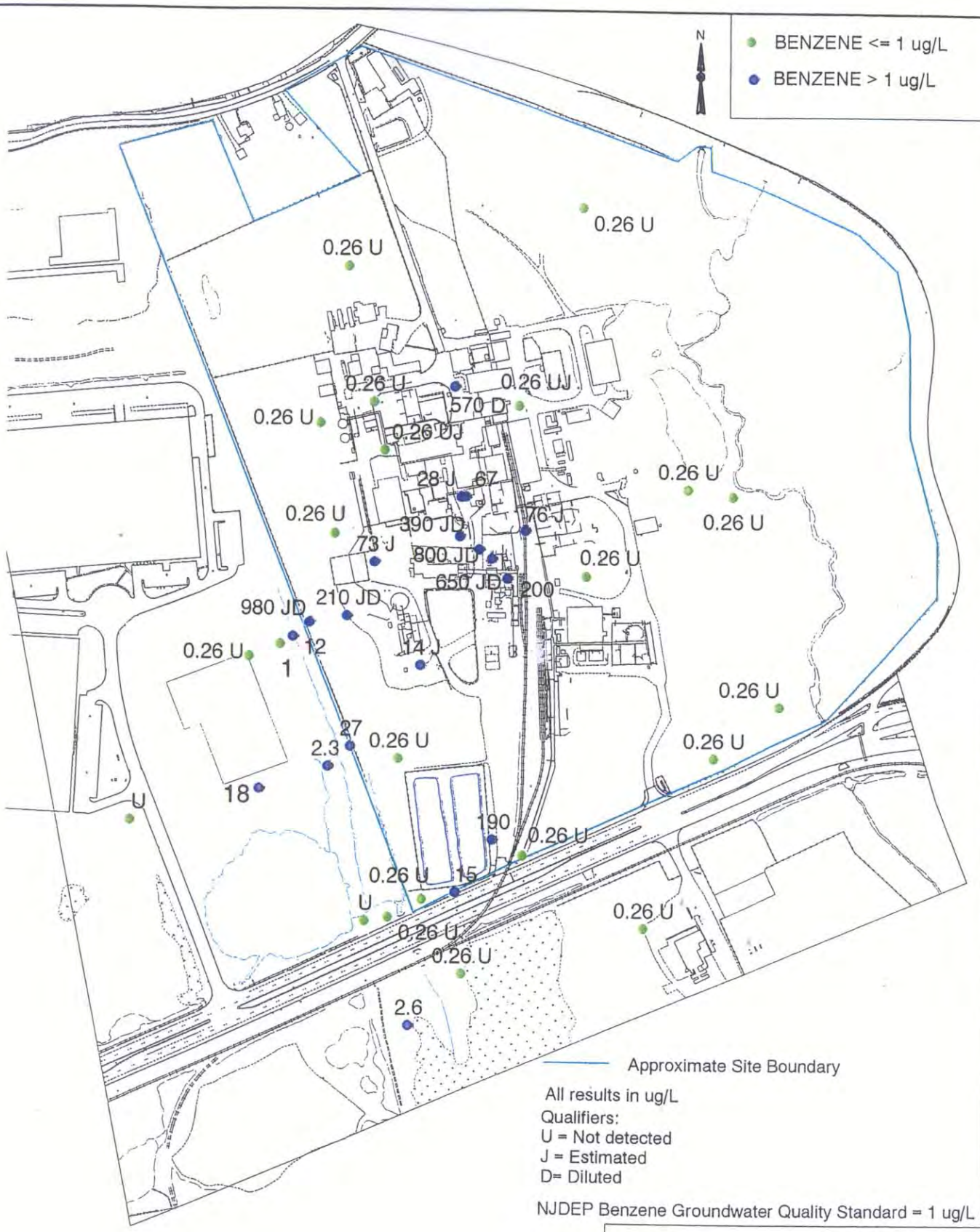
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE: AS SHOWN	DWG NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 7, 2001		FIG. NO. E-21

LIST OF FIGURES



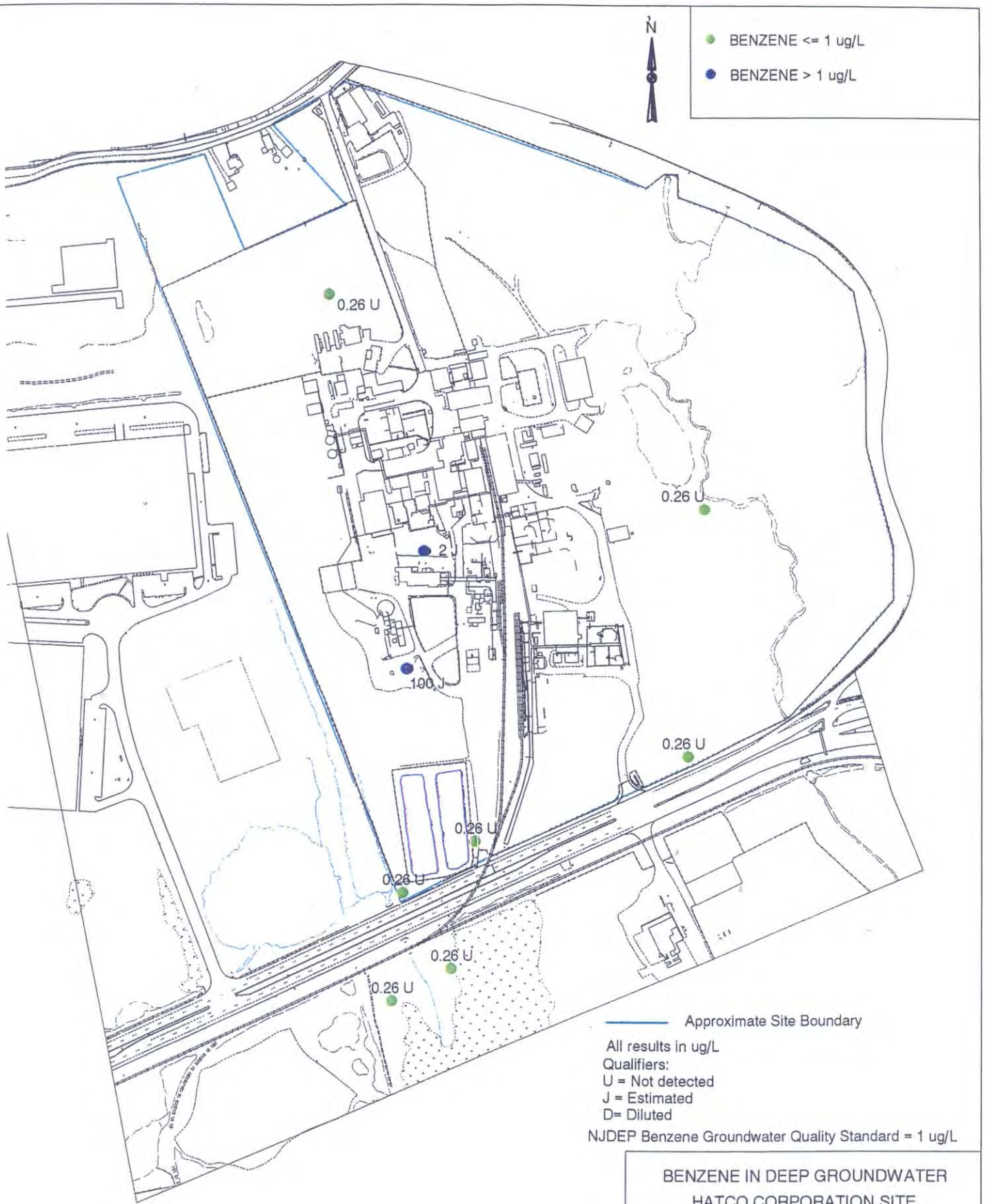
BENZENE IN SHALLOW GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

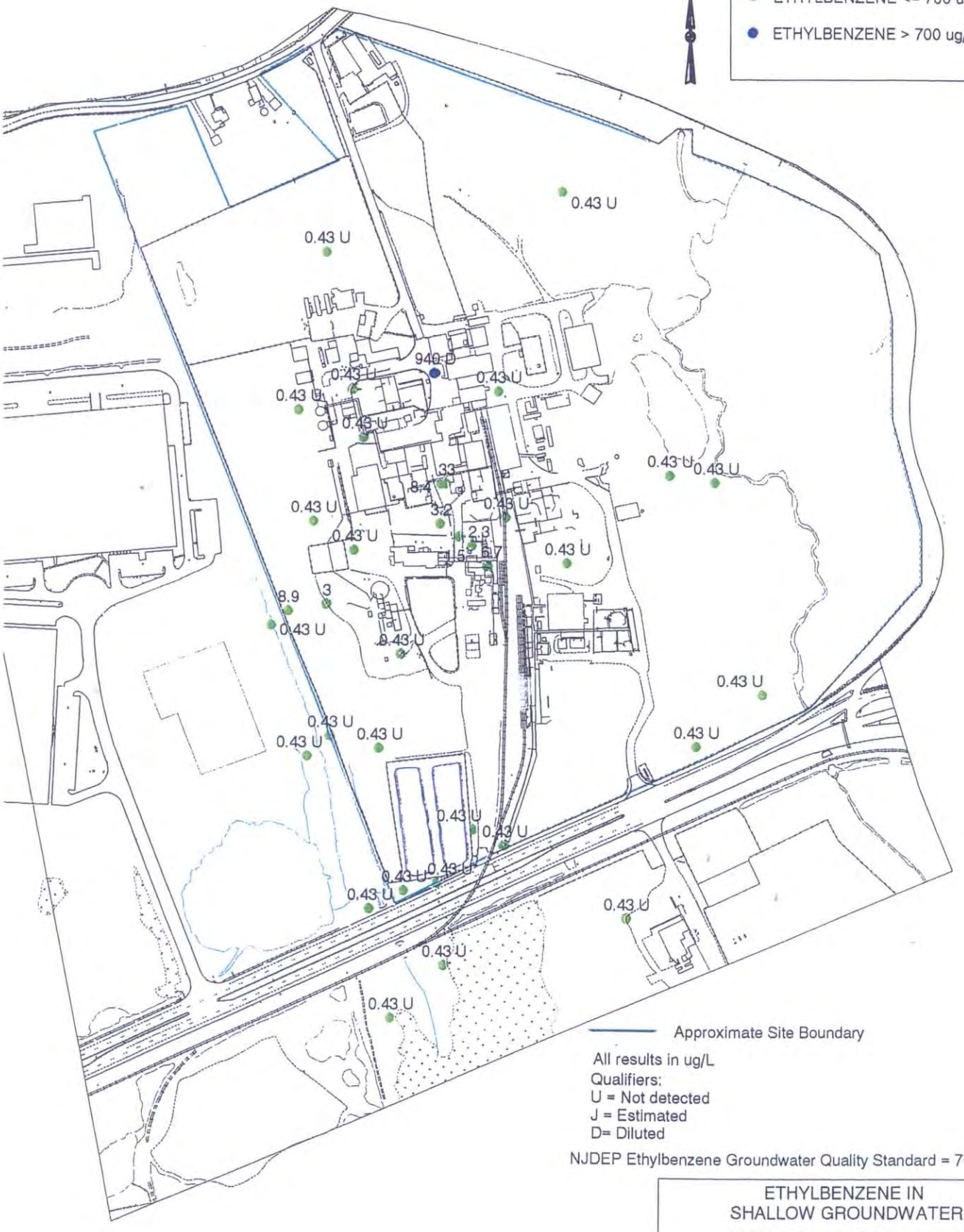
DR. BY RC	SCALE: AS SHOWN	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY GRJ	DATE: NOVEMBER 27, 2000	FIG. NO. F-1	



BENZENE IN DEEP GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-2



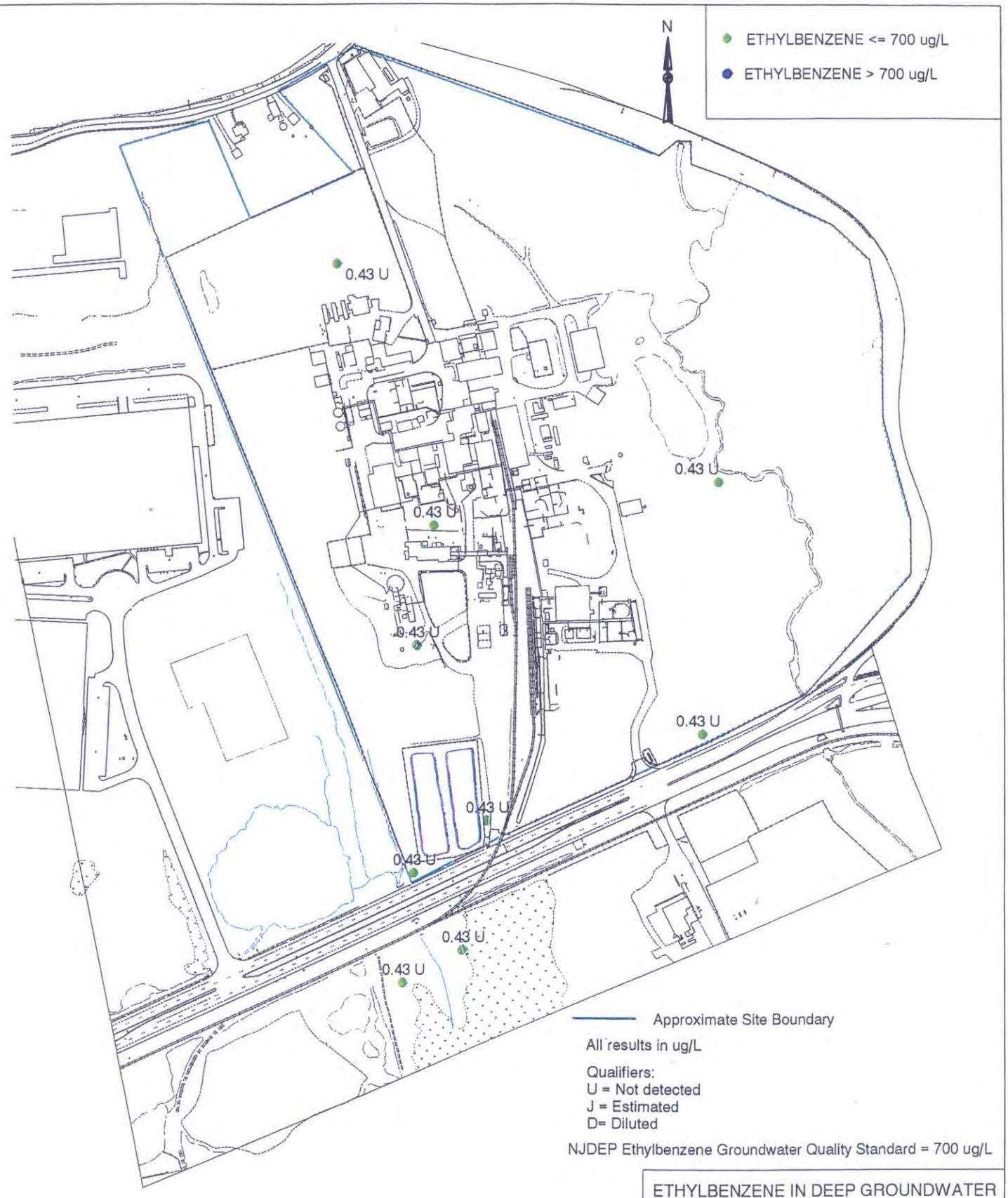
ETHYLBENZENE IN SHALLOW GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-3



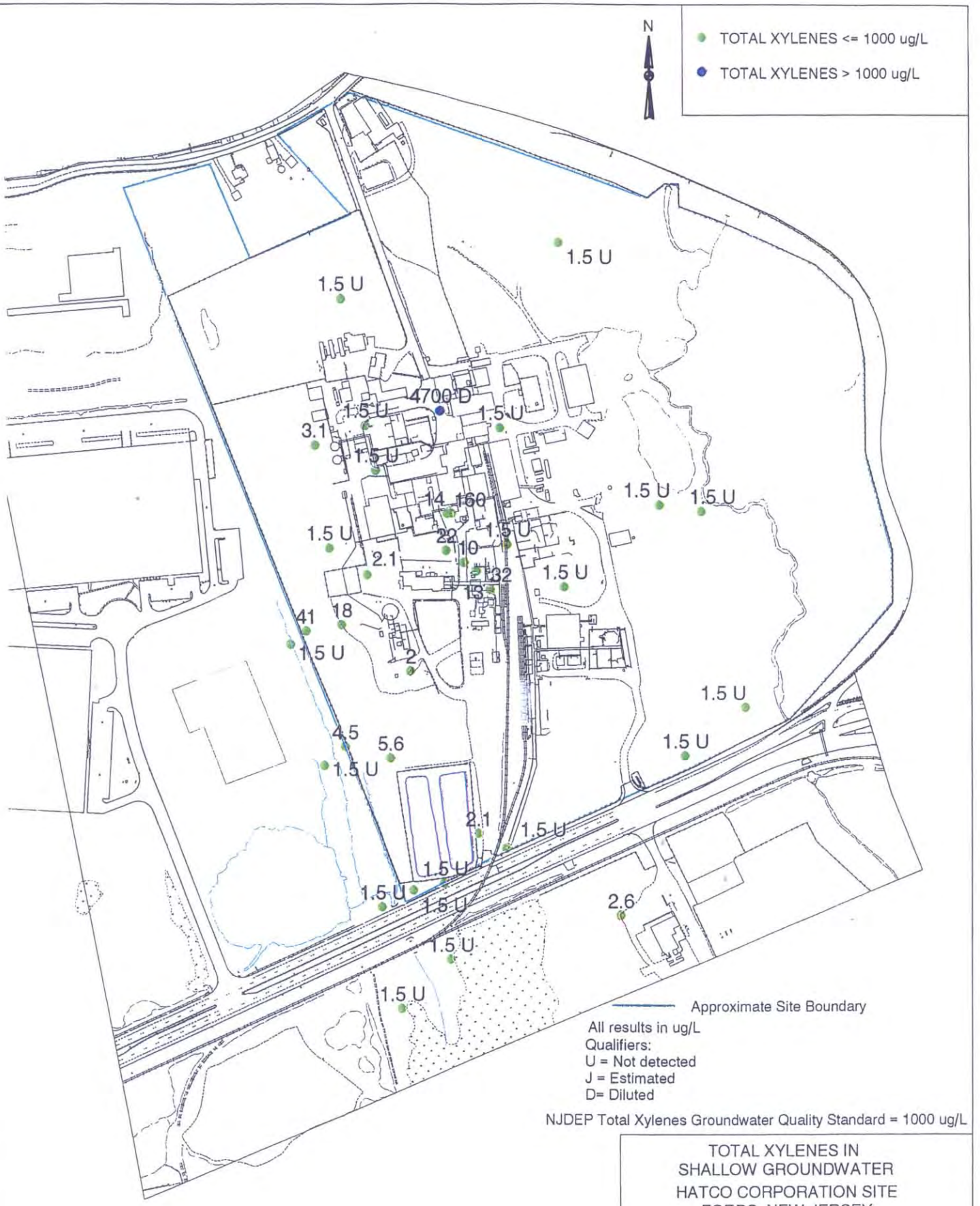
ETHYLBENZENE IN DEEP GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-4

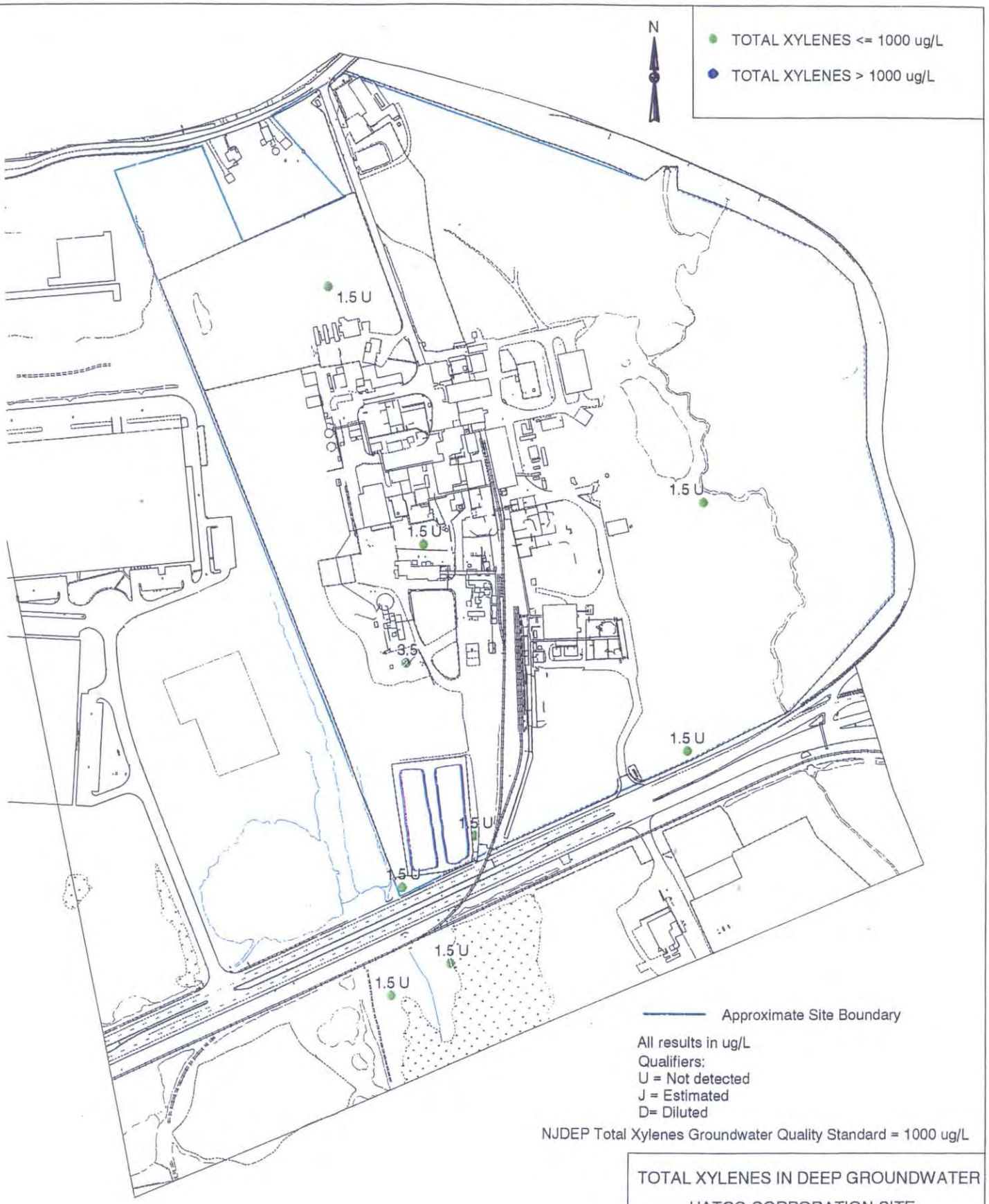


TOTAL XYLENES IN
SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-5



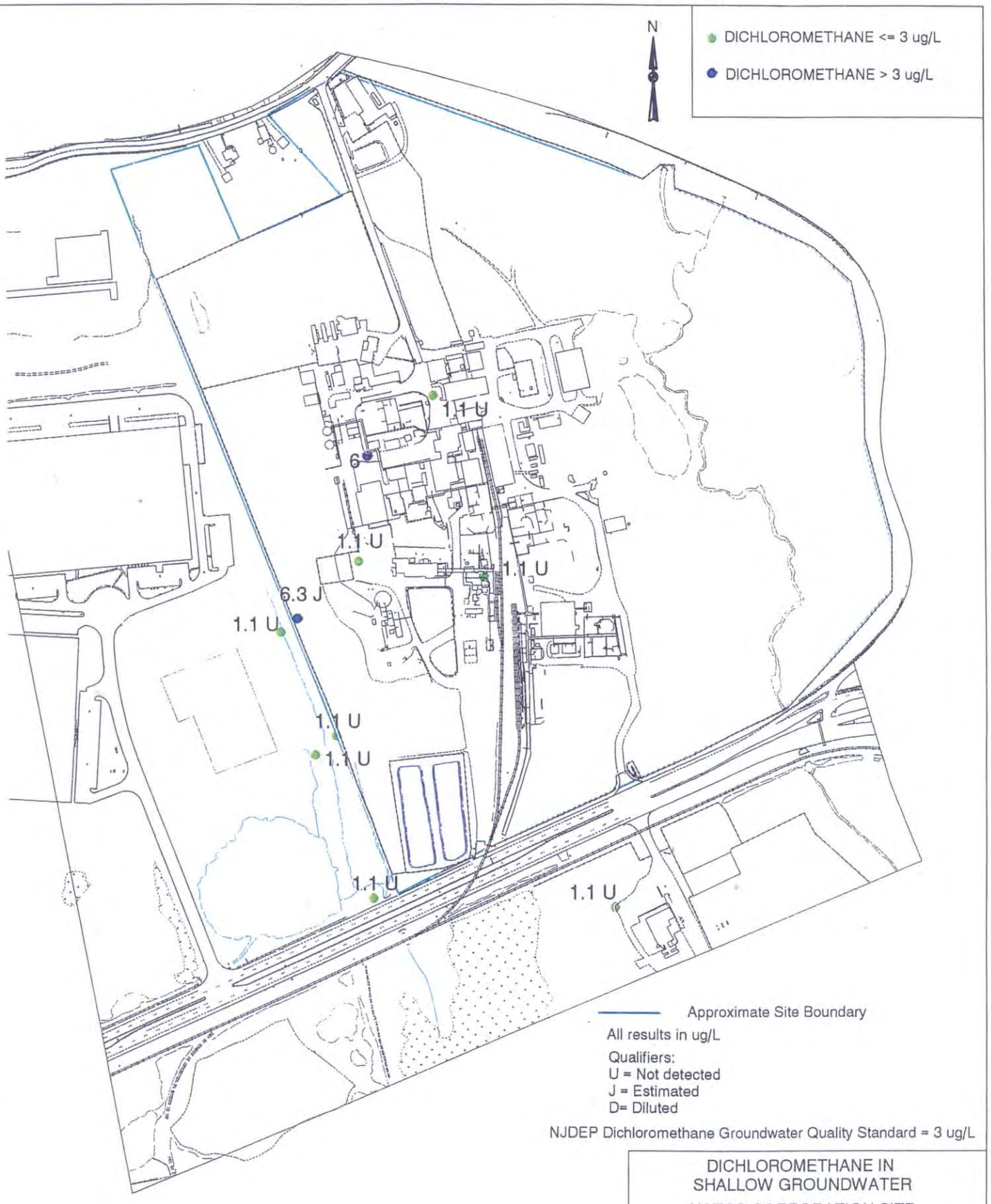
TOTAL XYLENES IN DEEP GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-6	



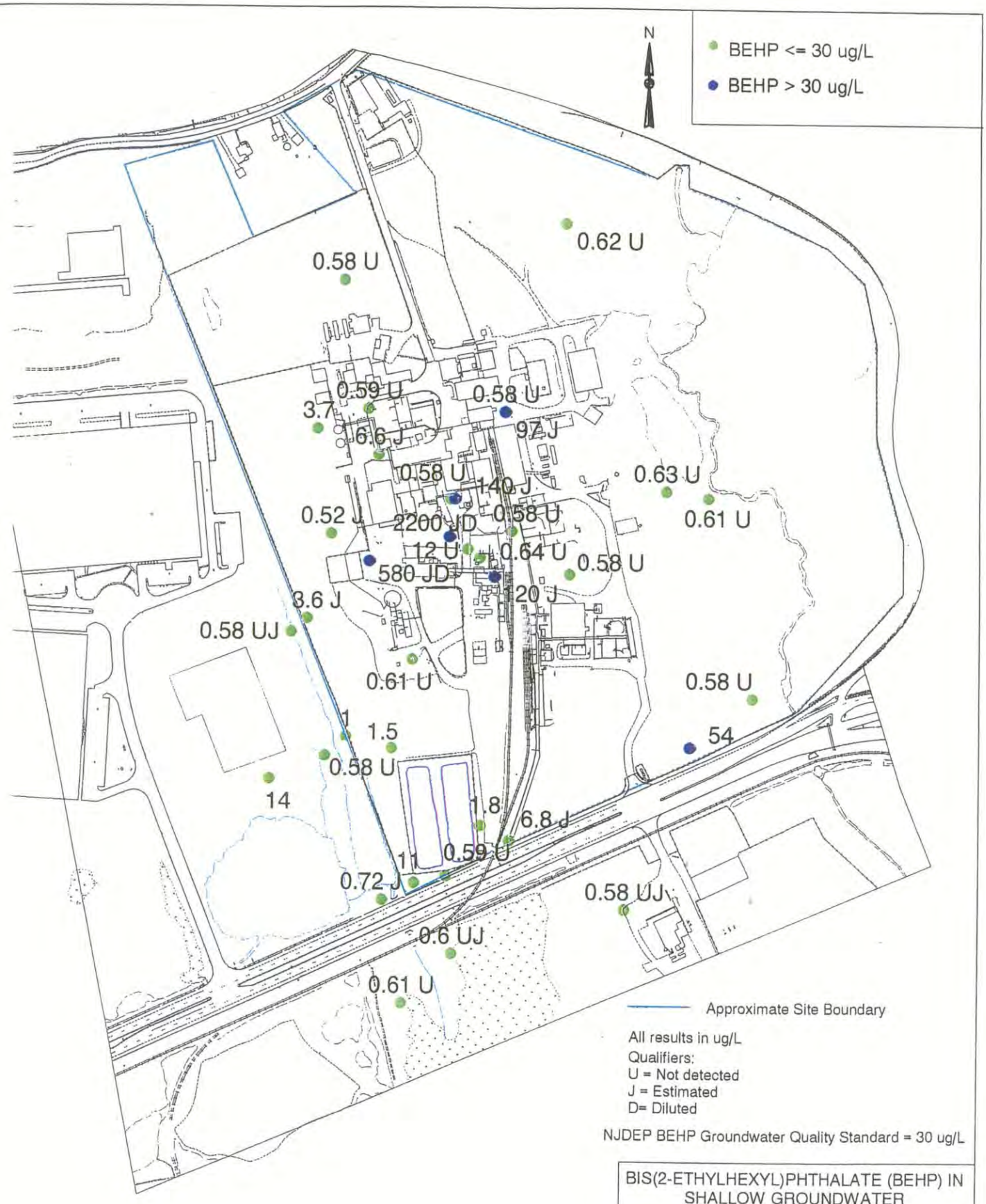
DICHLOROMETHANE IN SHALLOW GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-7



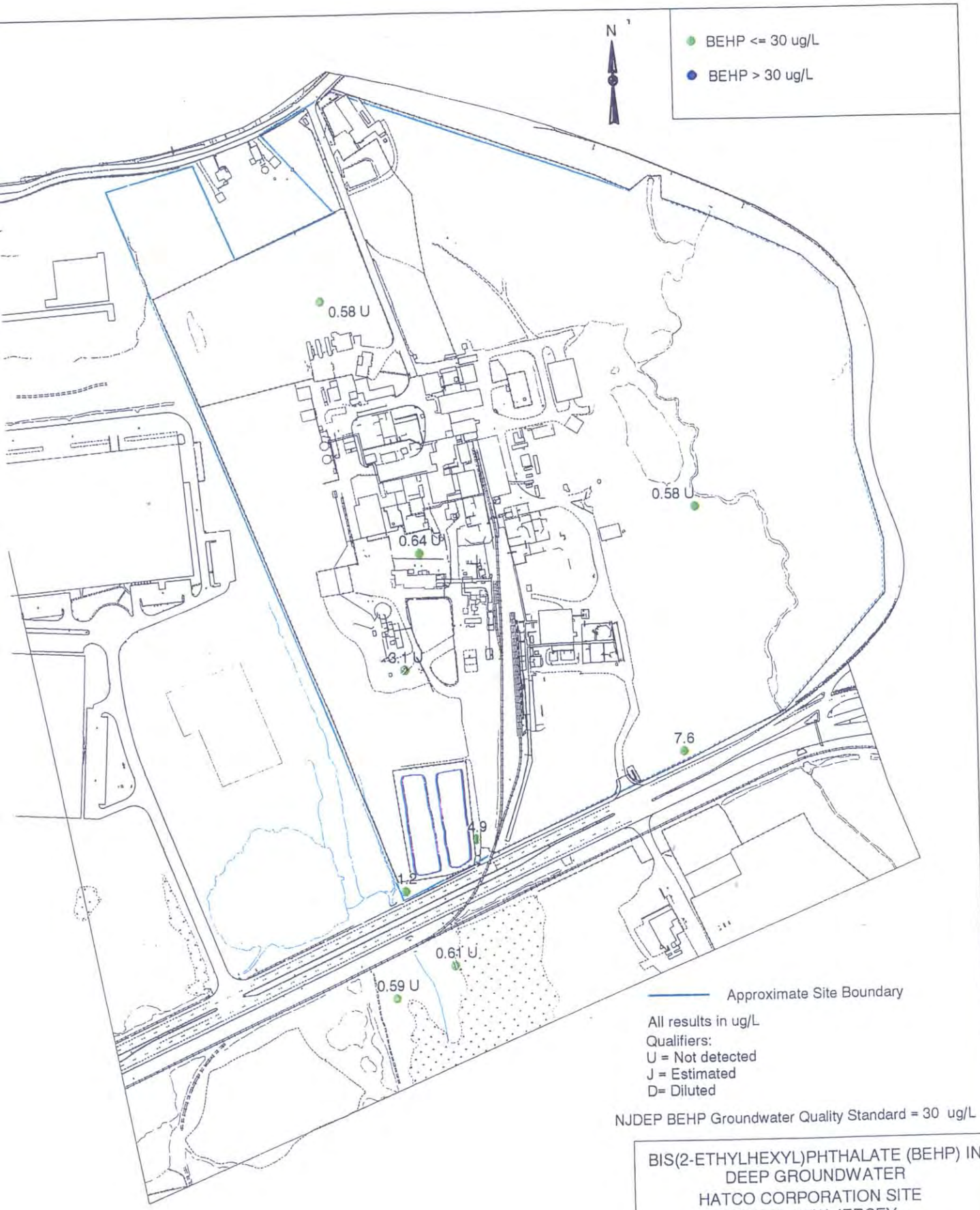
BIS(2-ETHYLHEXYL)PHTHALATE (BEHP) IN SHALLOW GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-8	

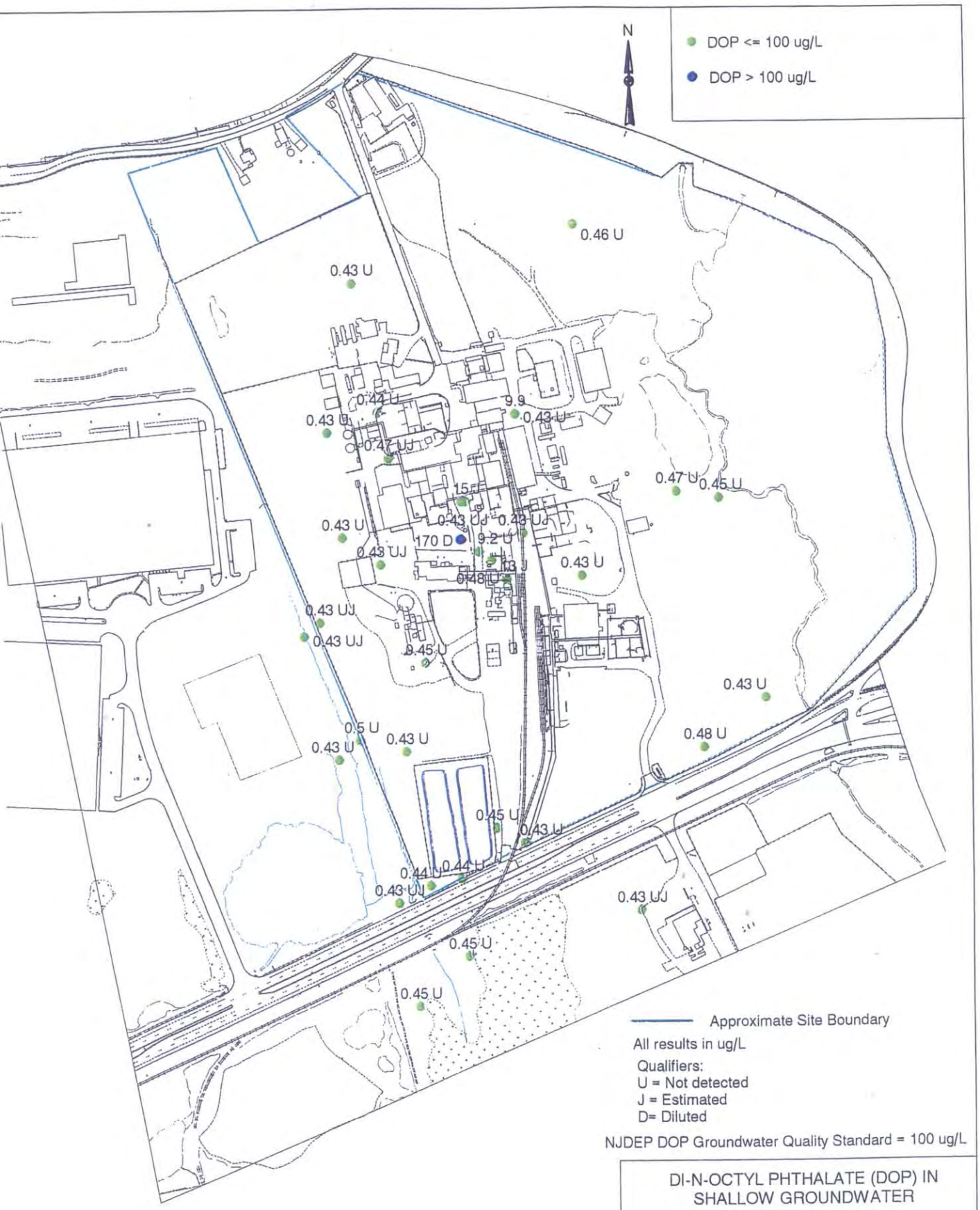


BIS(2-ETHYLHEXYL)PHTHALATE (BEHP) IN DEEP GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

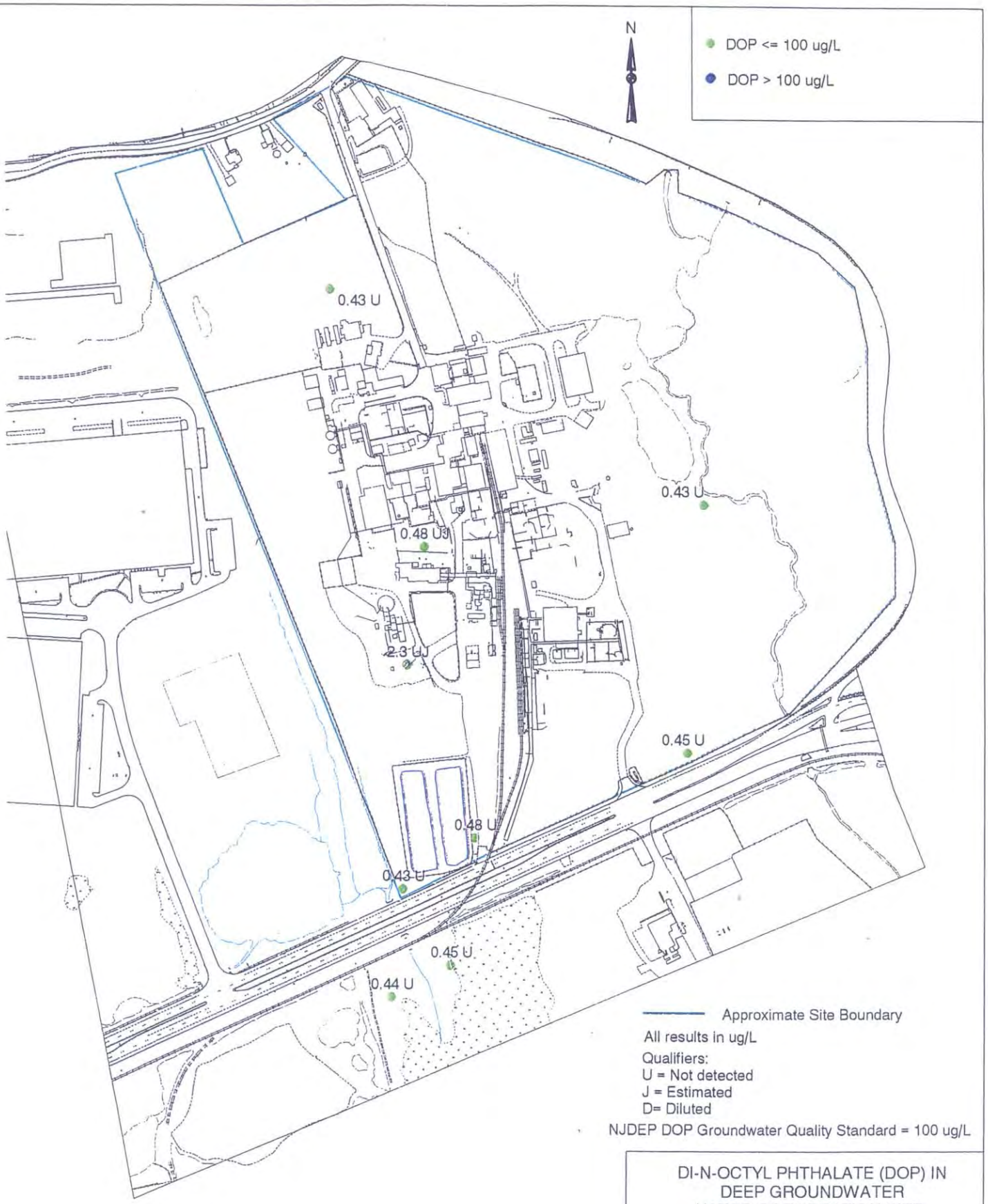
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-9



DI-N-OCTYL PHTHALATE (DOP) IN SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-10

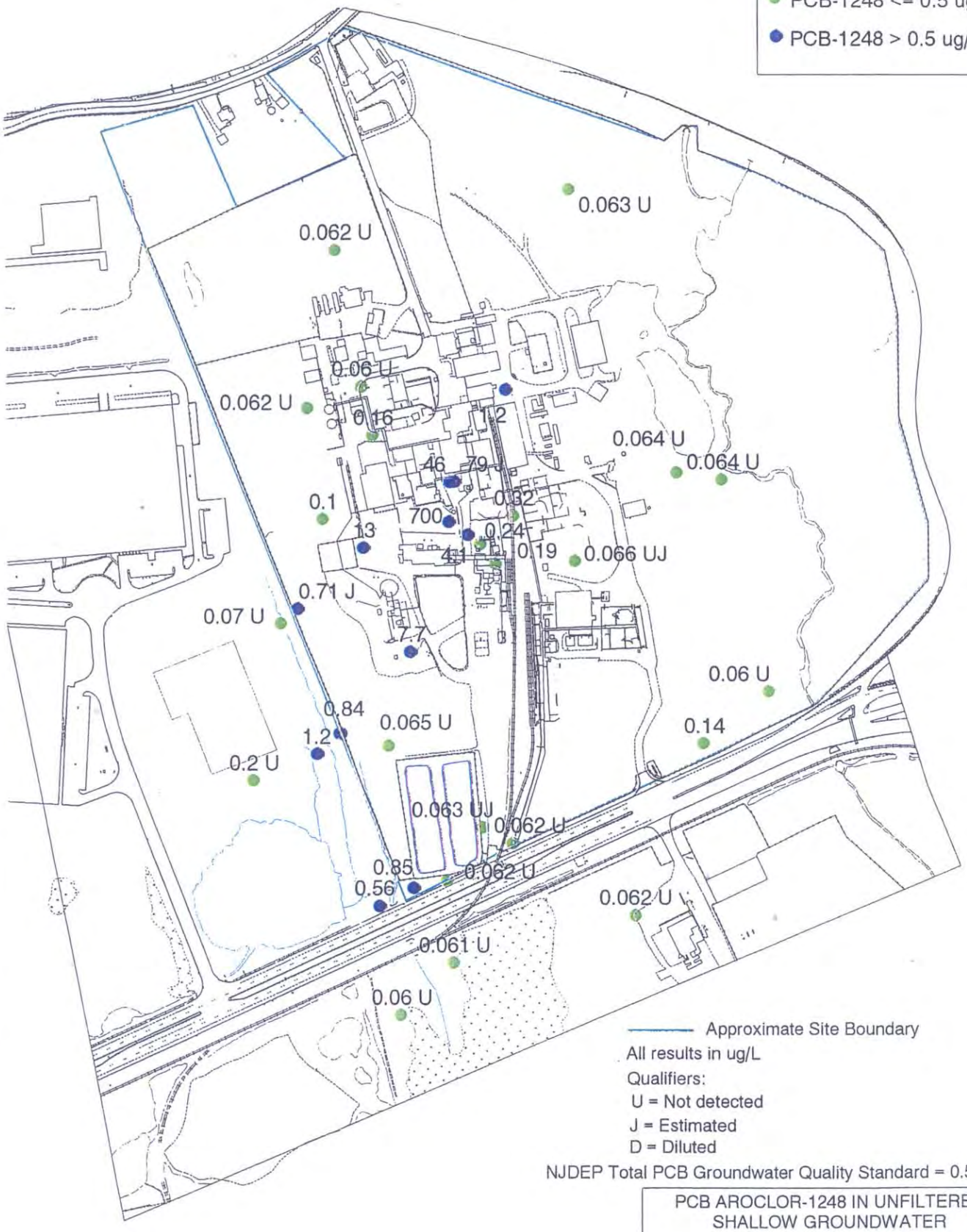


DI-N-OCTYL PHTHALATE (DOP) IN
DEEP GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

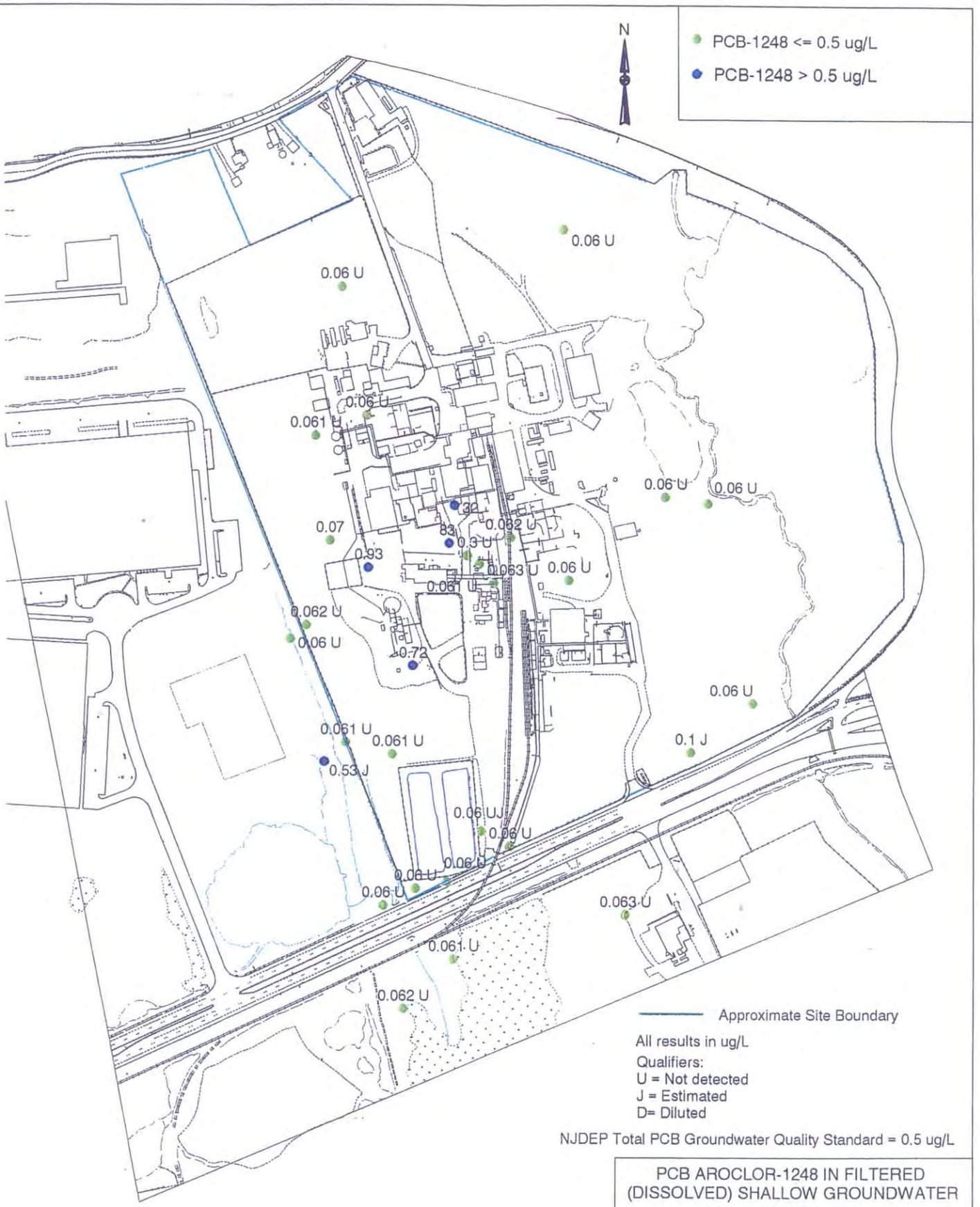
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	NOVEMBER 27, 2000		FIG. NO. F-11



PCB AROCLOR-1248 IN UNFILTERED SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE: AS SHOWN	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY GRJ	DATE: NOVEMBER 27, 2000		FIG. NO. F-12

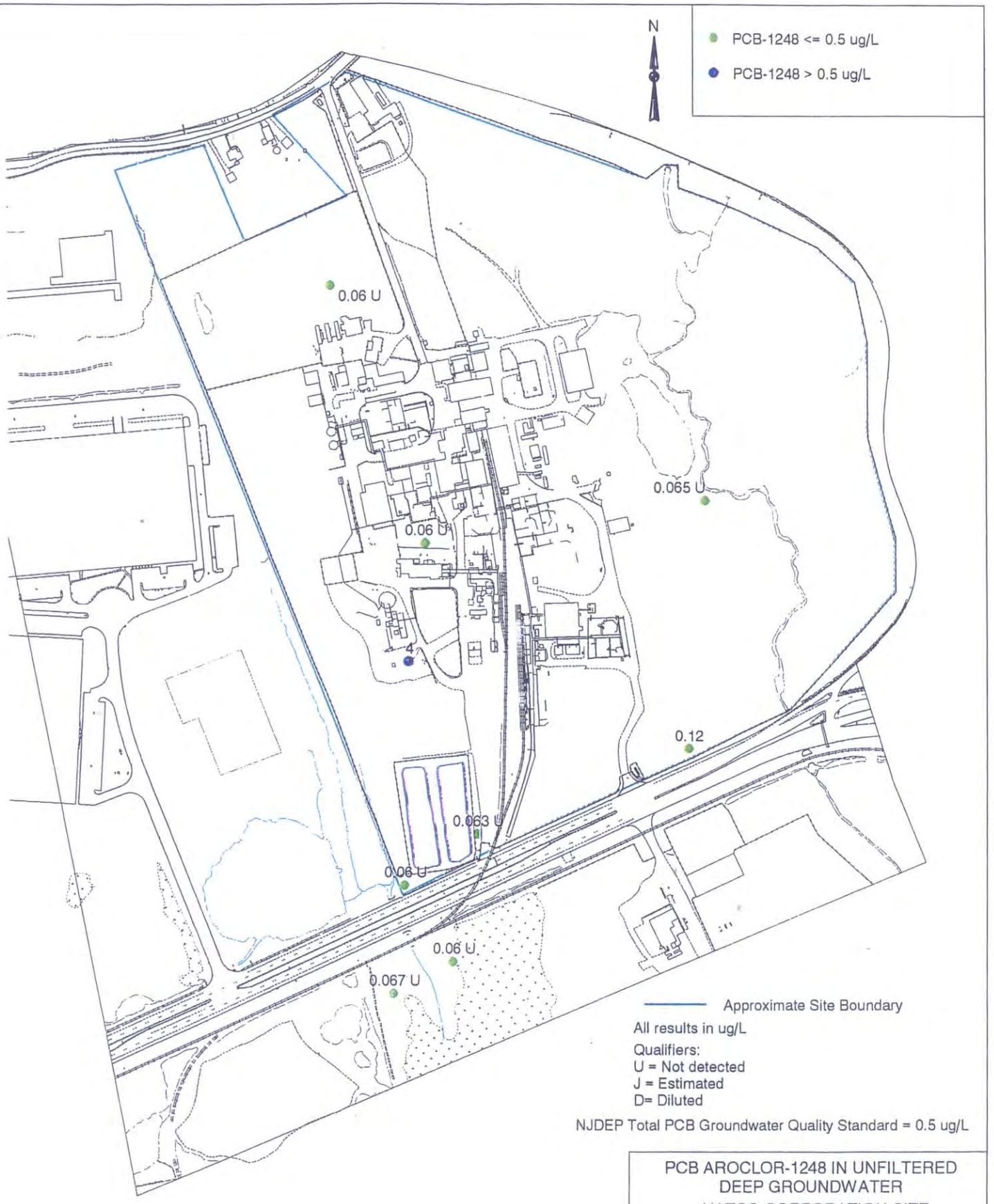


PCB AROCLOR-1248 IN FILTERED (DISSOLVED) SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY	RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY	MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-13



PCB AROCLOR-1248 IN UNFILTERED DEEP GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

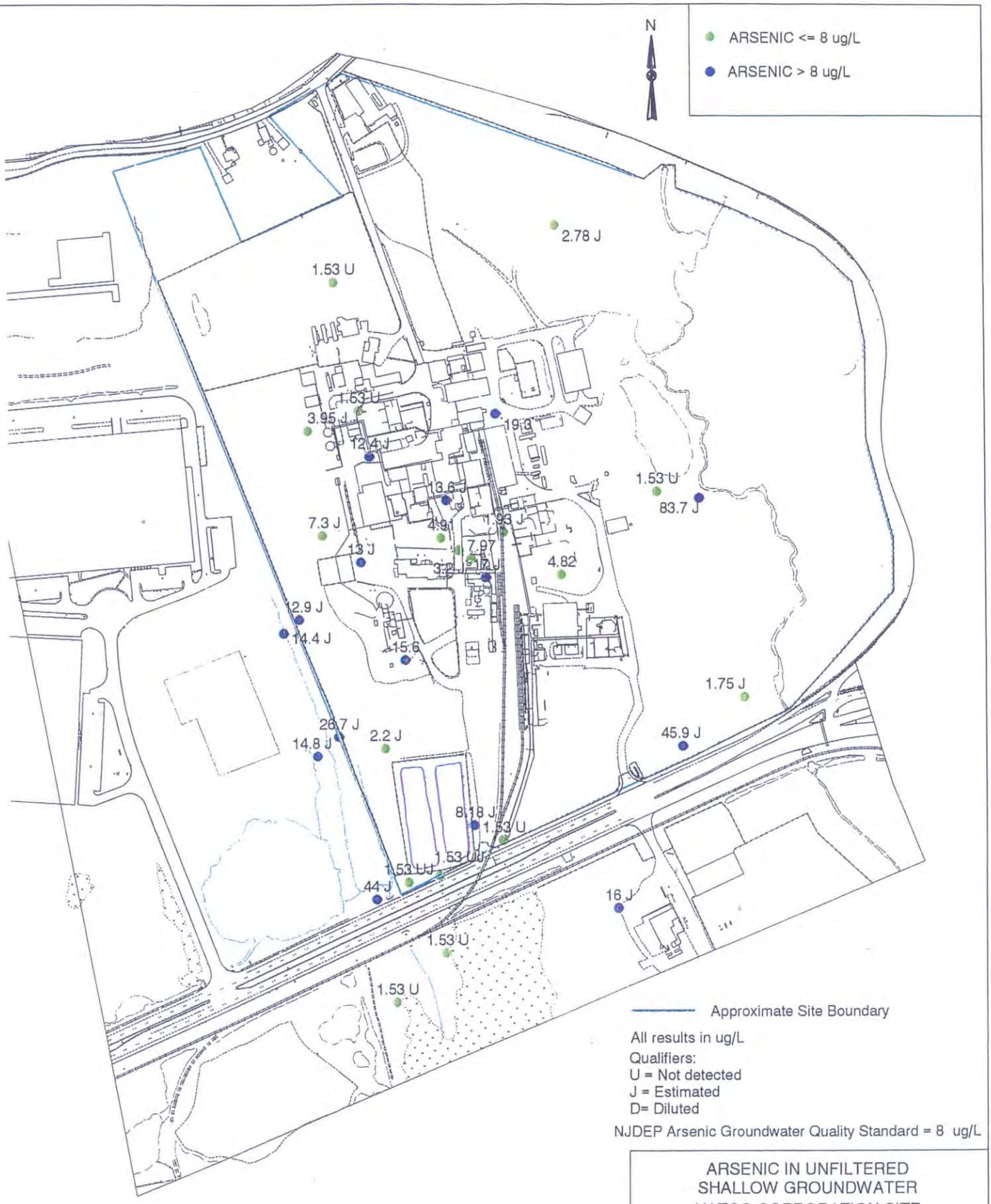
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-14

PCB AROCLOR-1248 IN FILTERED (DISSOLVED) DEEP GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-15

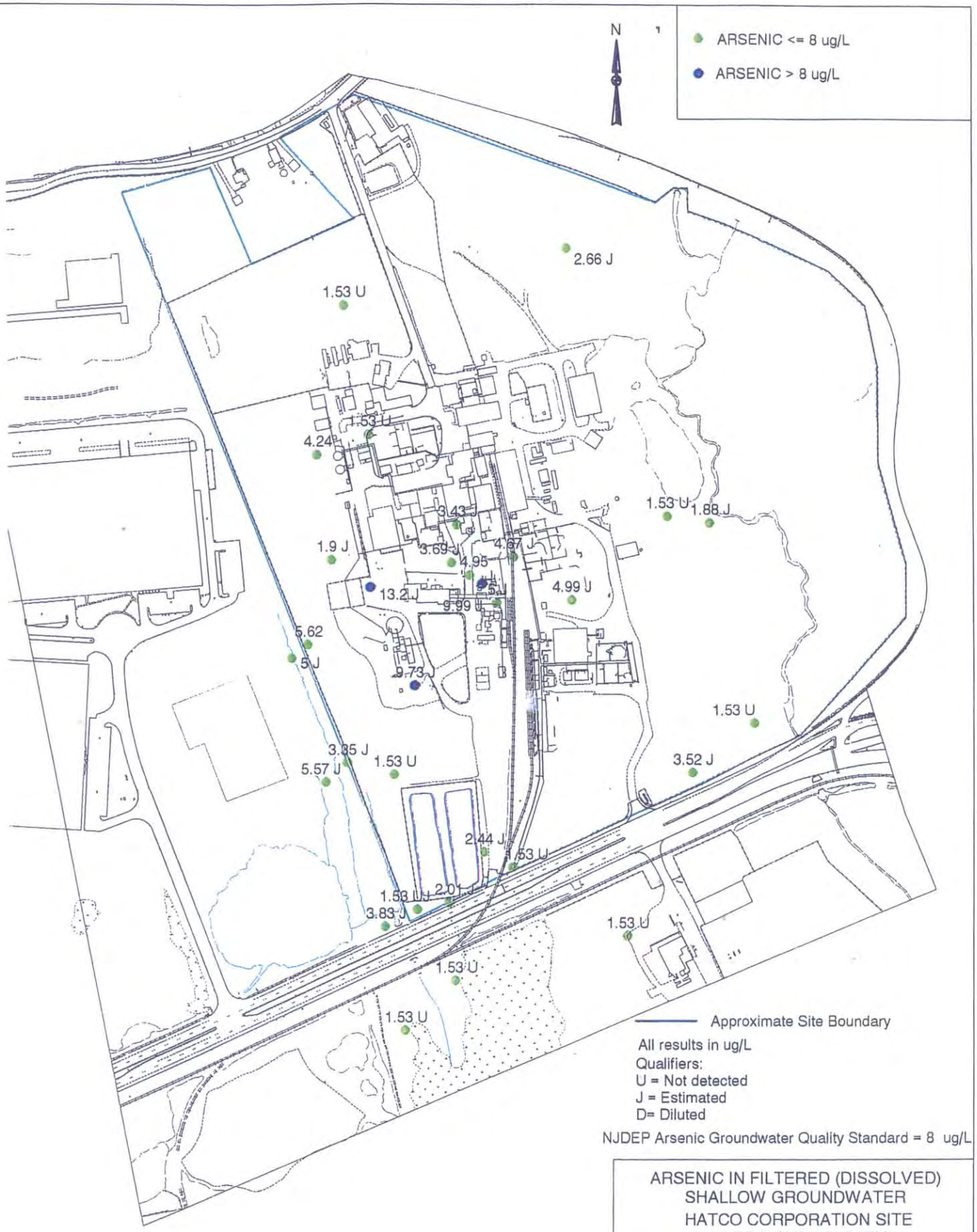


ARSENIC IN UNFILTERED
SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-16

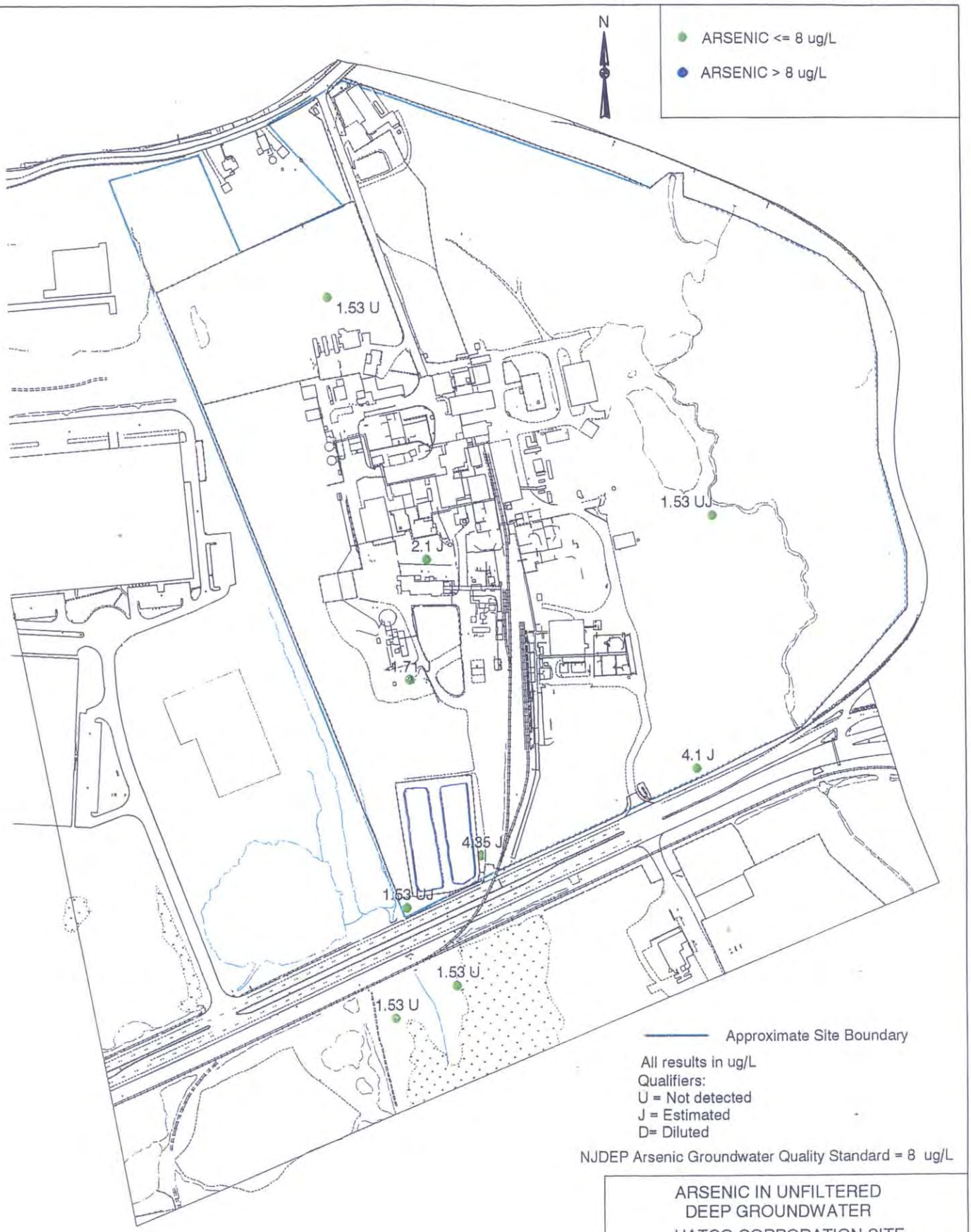


ARSENIC IN FILTERED (DISSOLVED)
SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-17

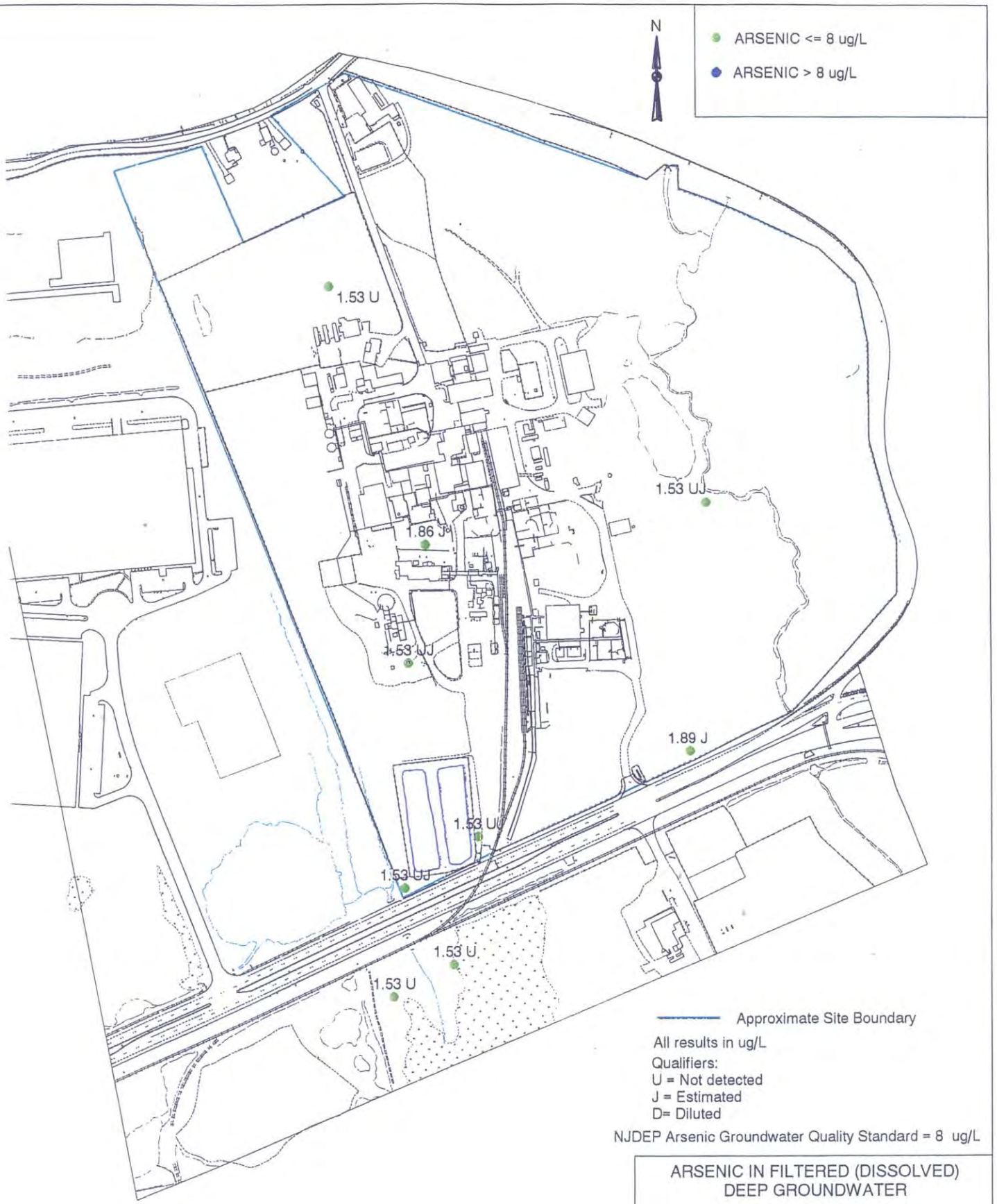


ARSENIC IN UNFILTERED
DEEP GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-18	



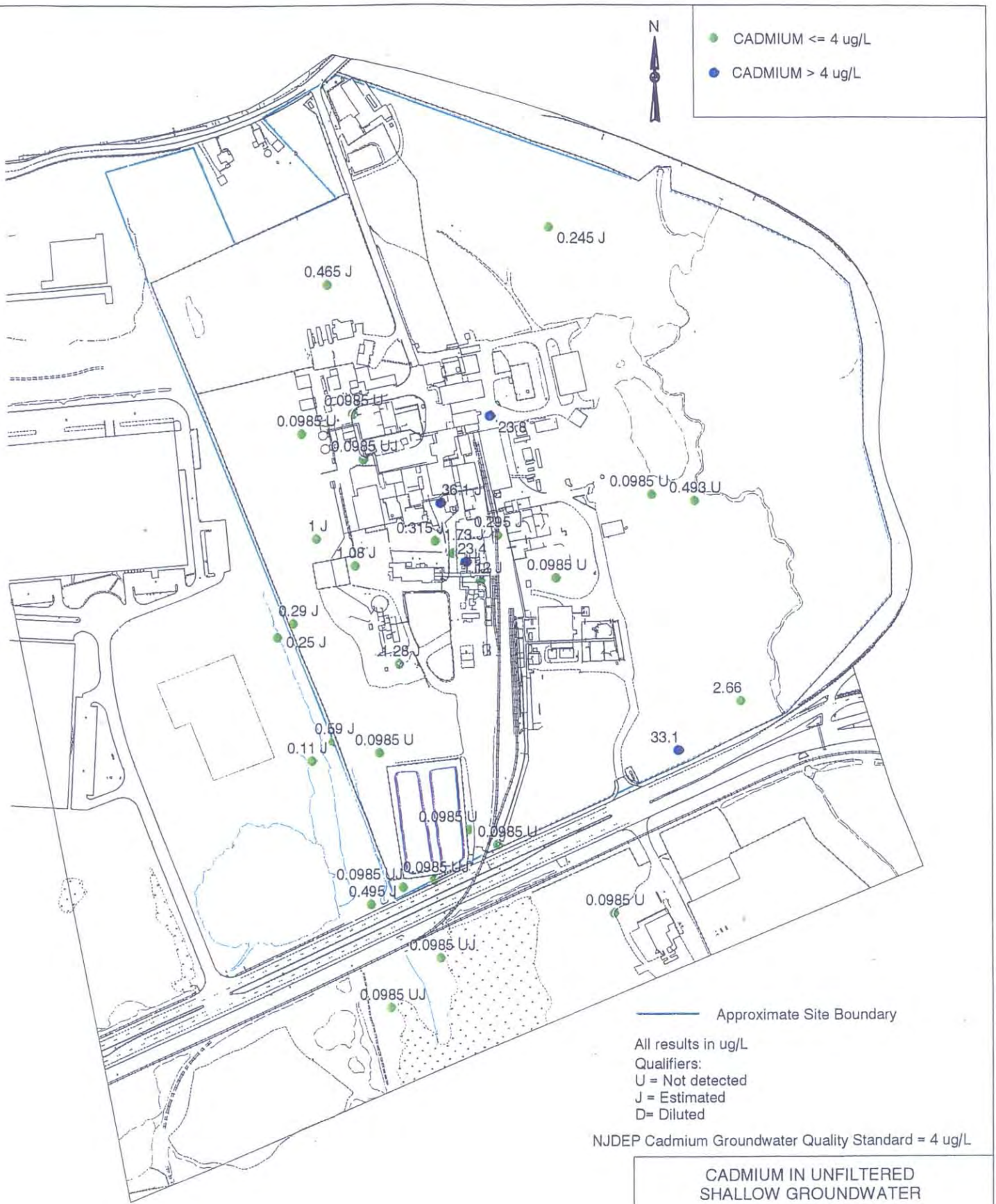
ARSENIC IN FILTERED (DISSOLVED) DEEP GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-19

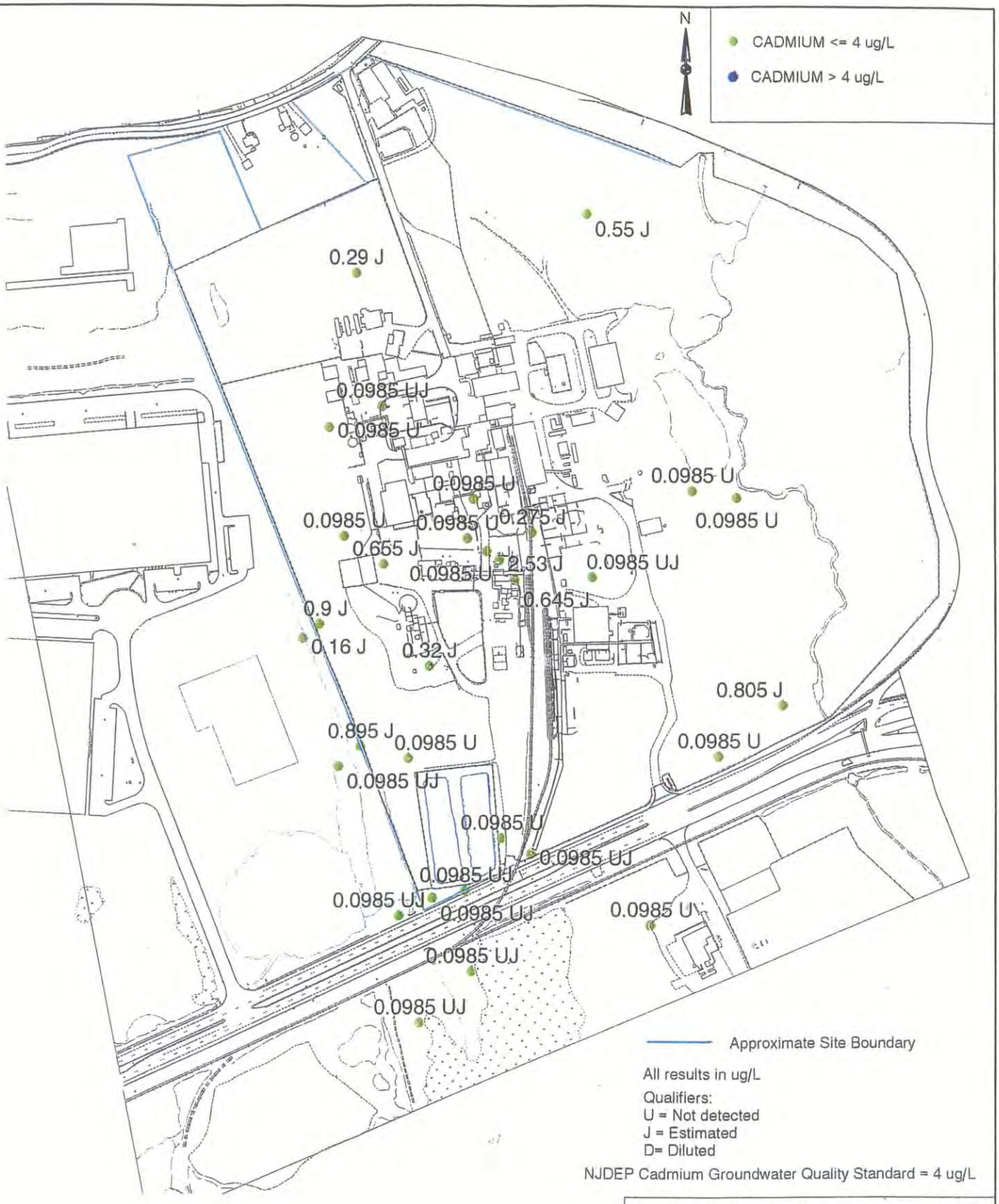


CADMIUM IN UNFILTERED
SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

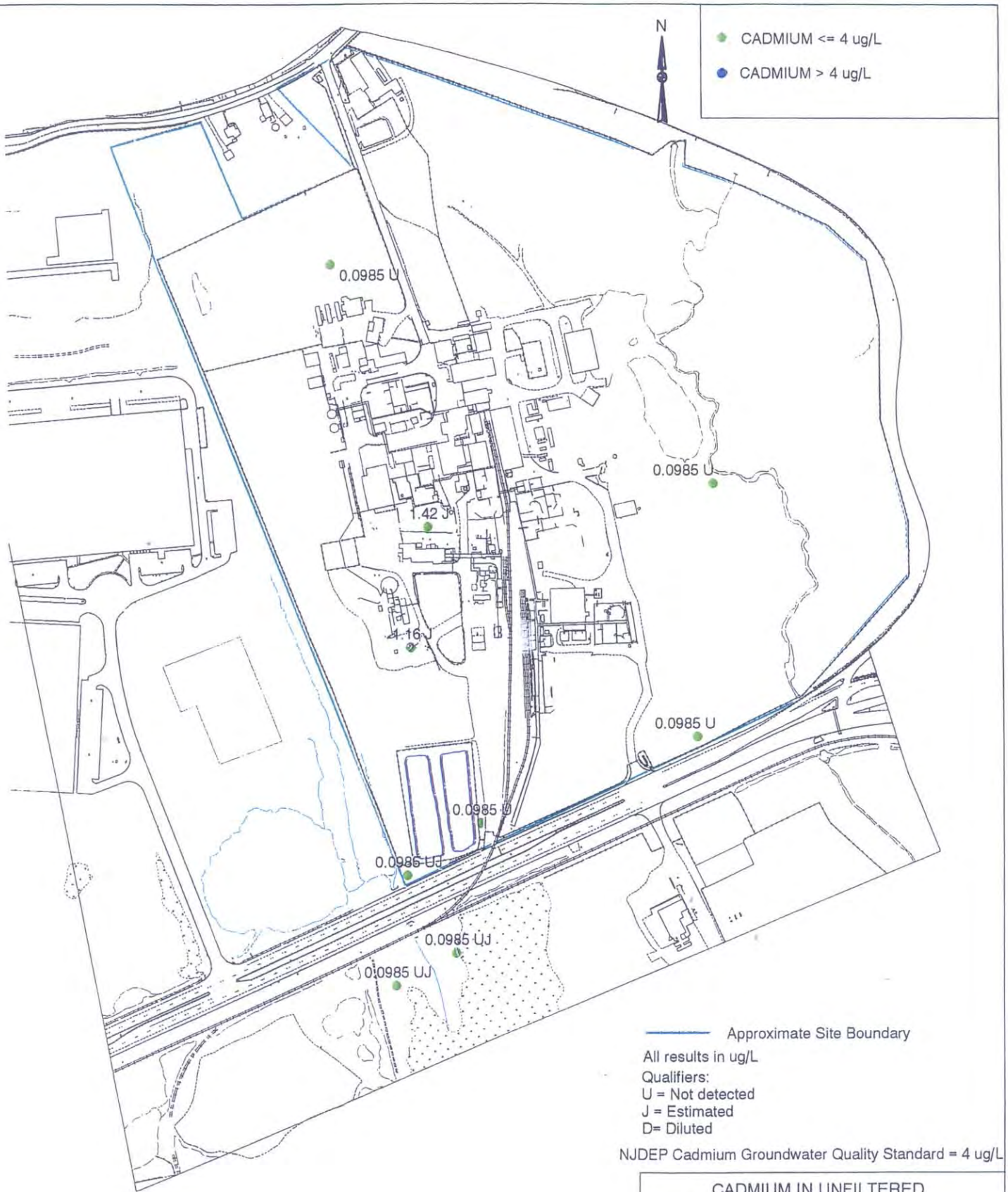
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-20



CADMIUM IN FILTERED (DISSOLVED)
SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-21	

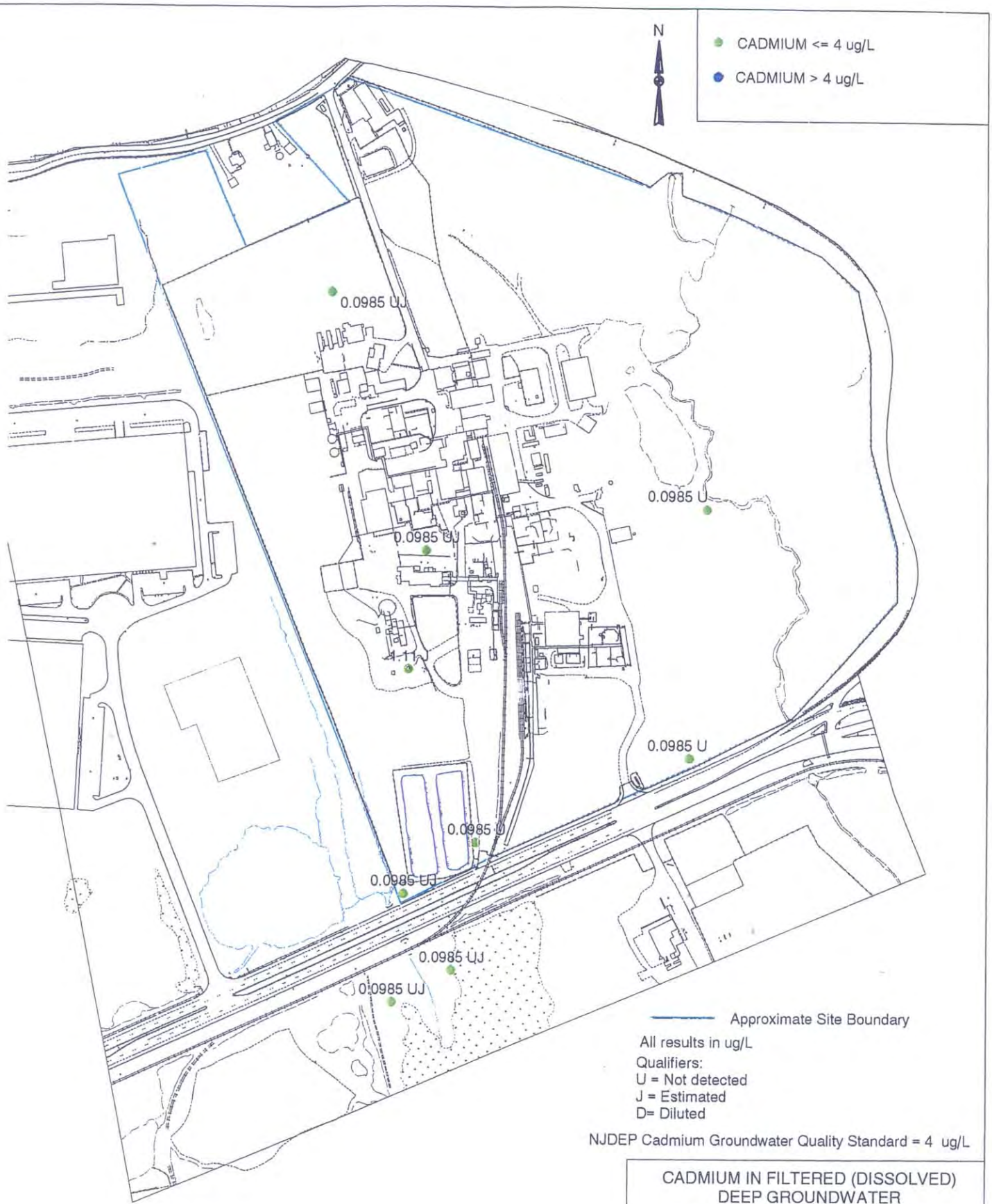


CADMIUM IN UNFILTERED
DEEP GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-22



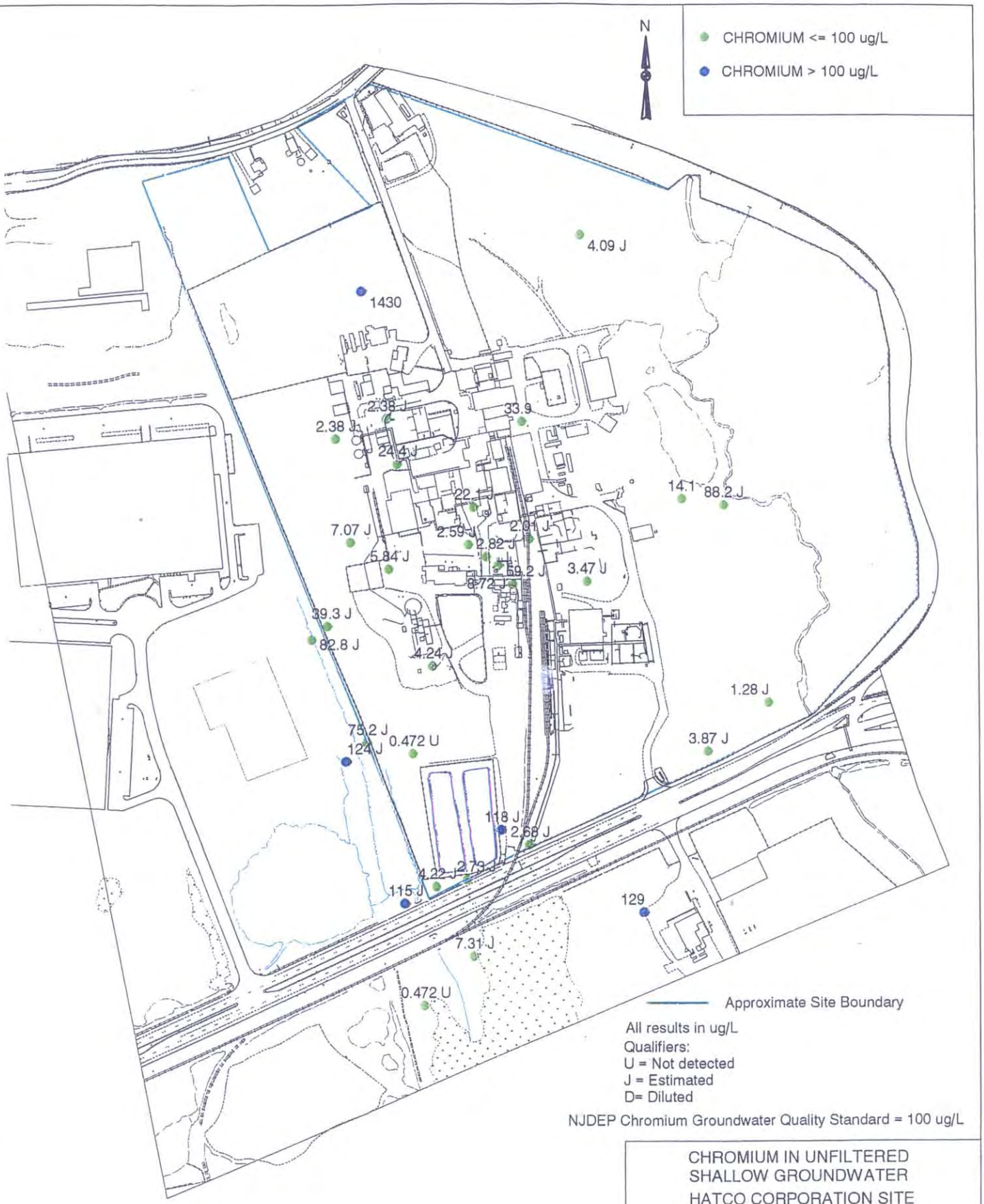
CADMIUM IN FILTERED (DISSOLVED) DEEP GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

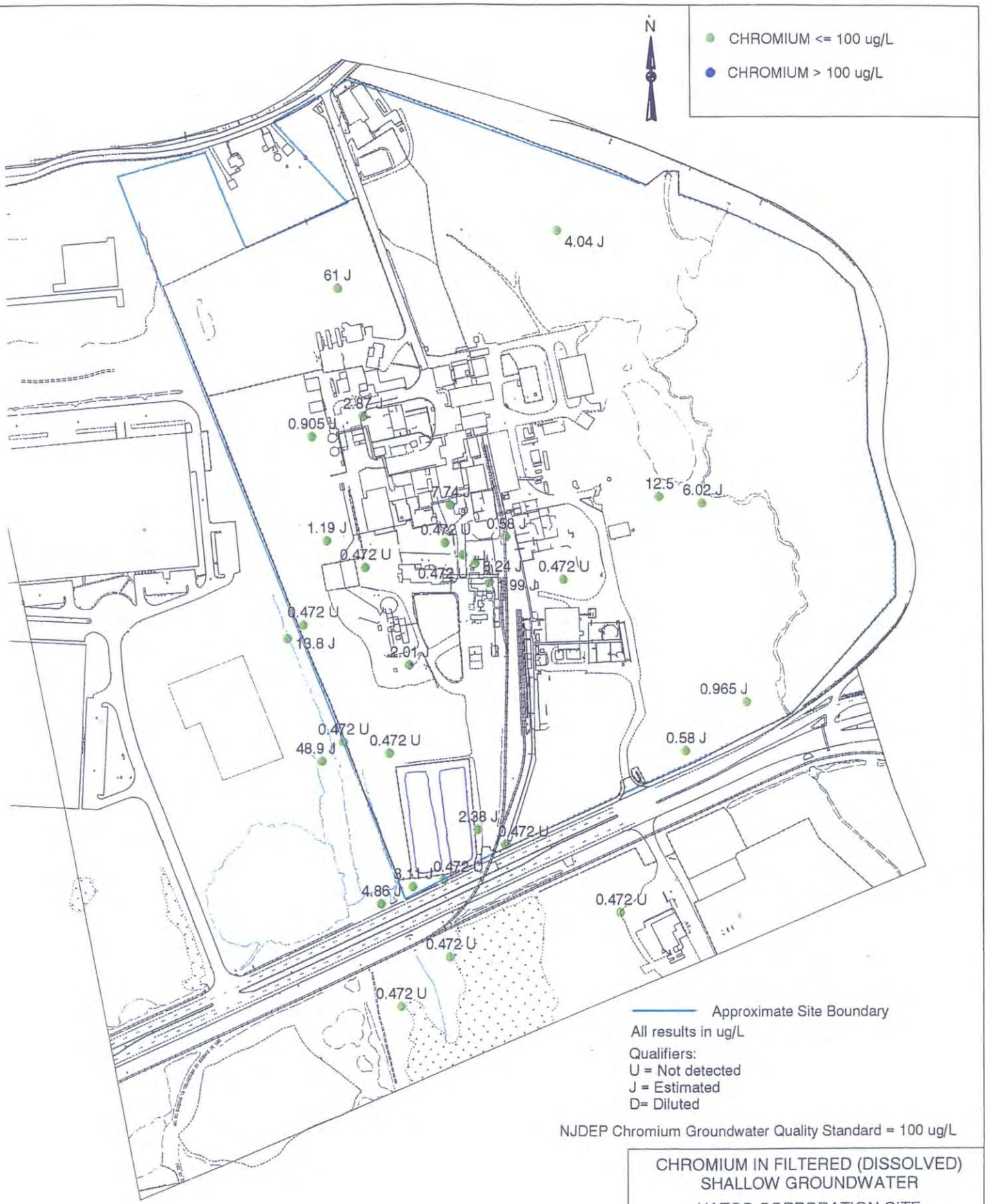
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-23



CHROMIUM IN UNFILTERED SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-24



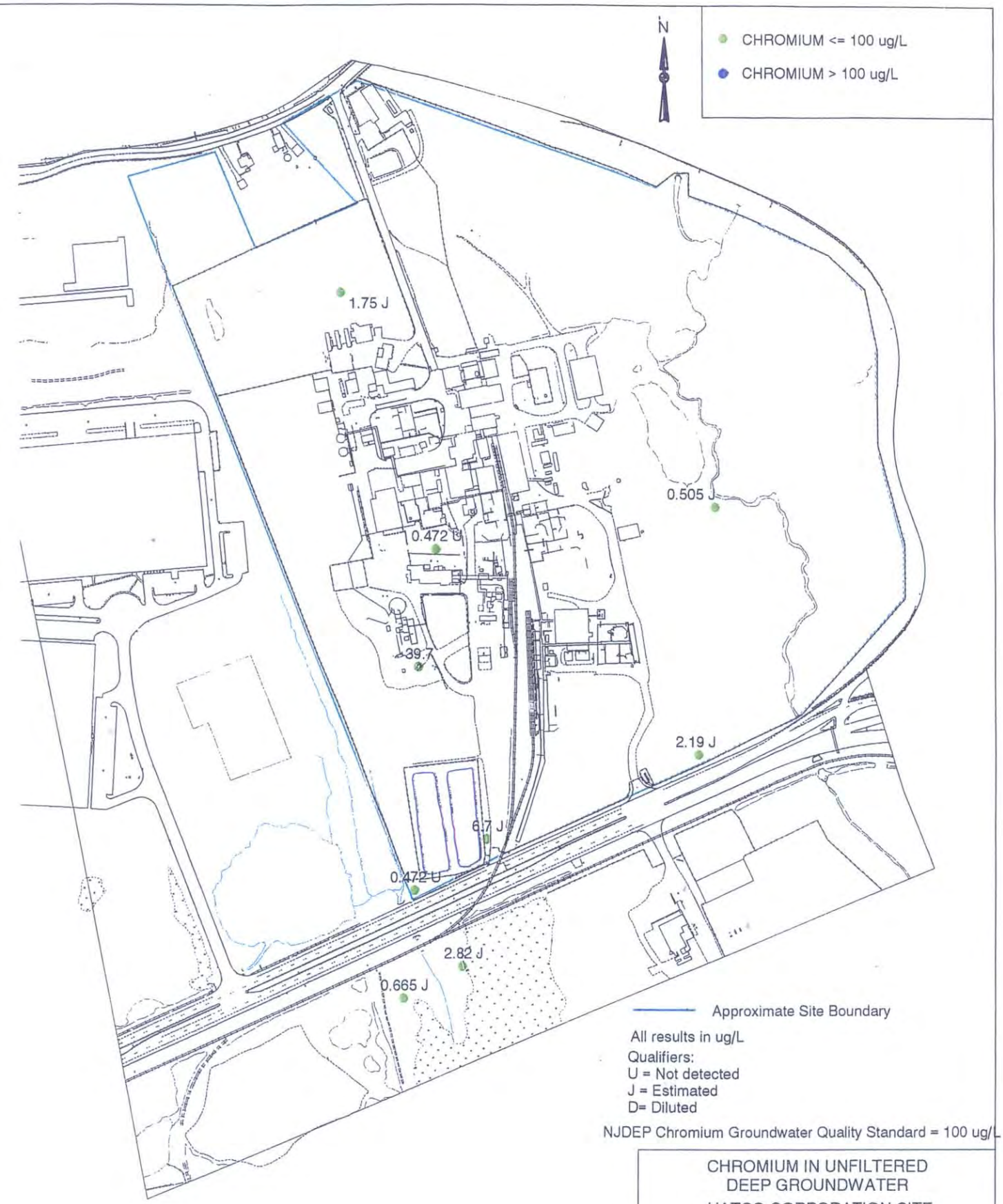
CHROMIUM IN FILTERED (DISSOLVED)
SHALLOW GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-25



CHROMIUM IN UNFILTERED DEEP GROUNDWATER

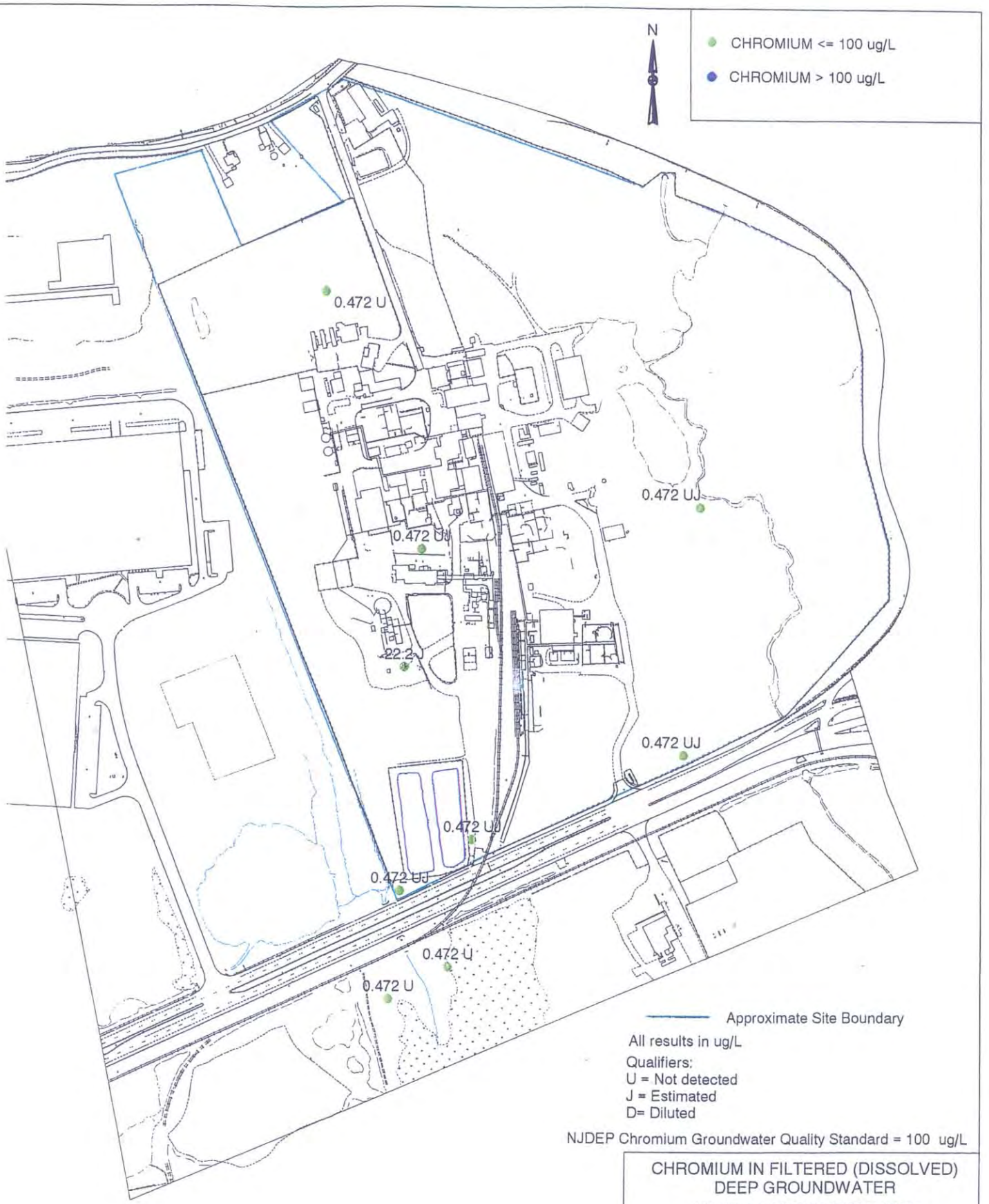
HATCO CORPORATION SITE

FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-26	

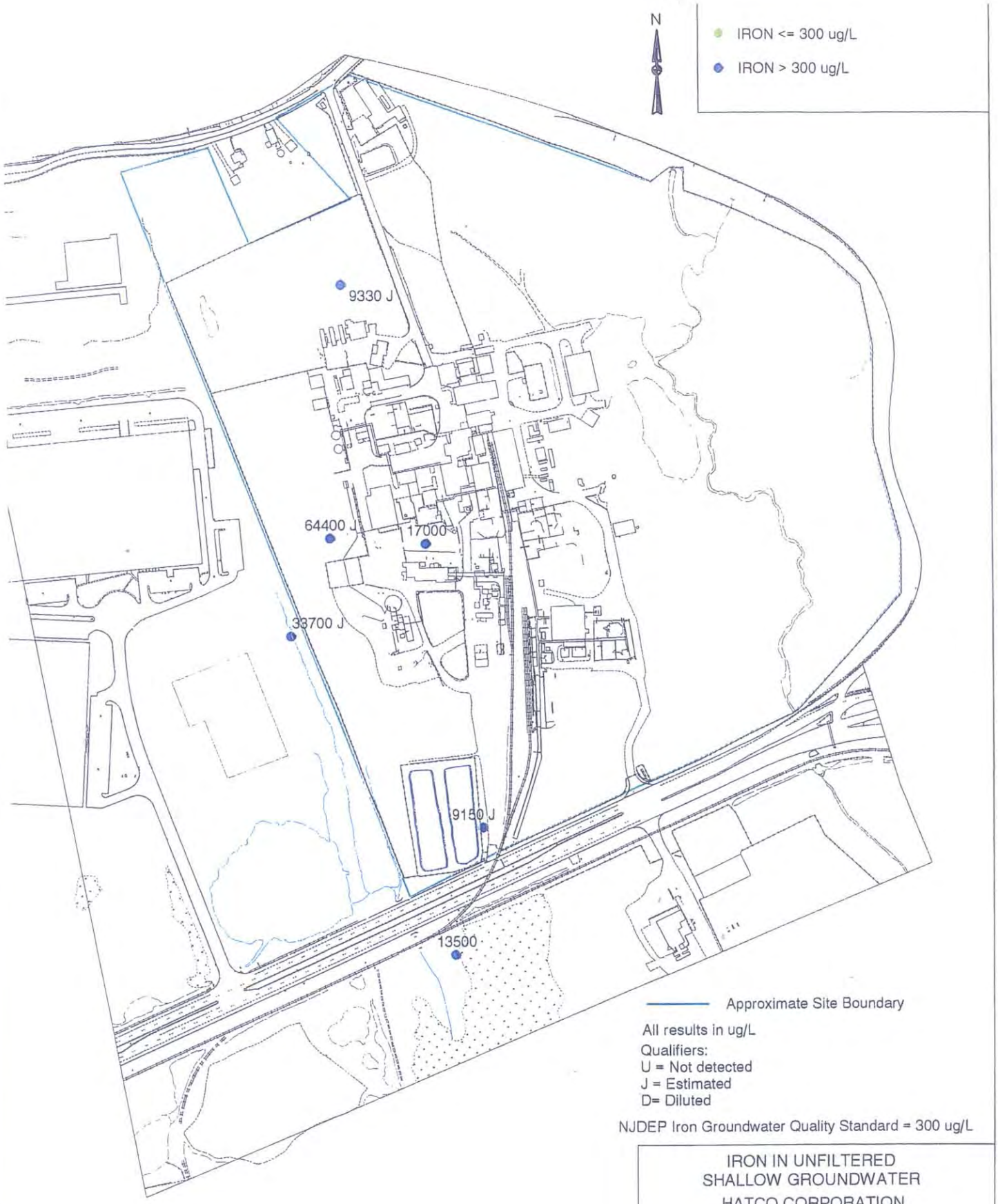


CHROMIUM IN FILTERED (DISSOLVED) DEEP GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-27



All results in ug/L

Qualifiers:
U = Not detected
J = Estimated
D= Diluted

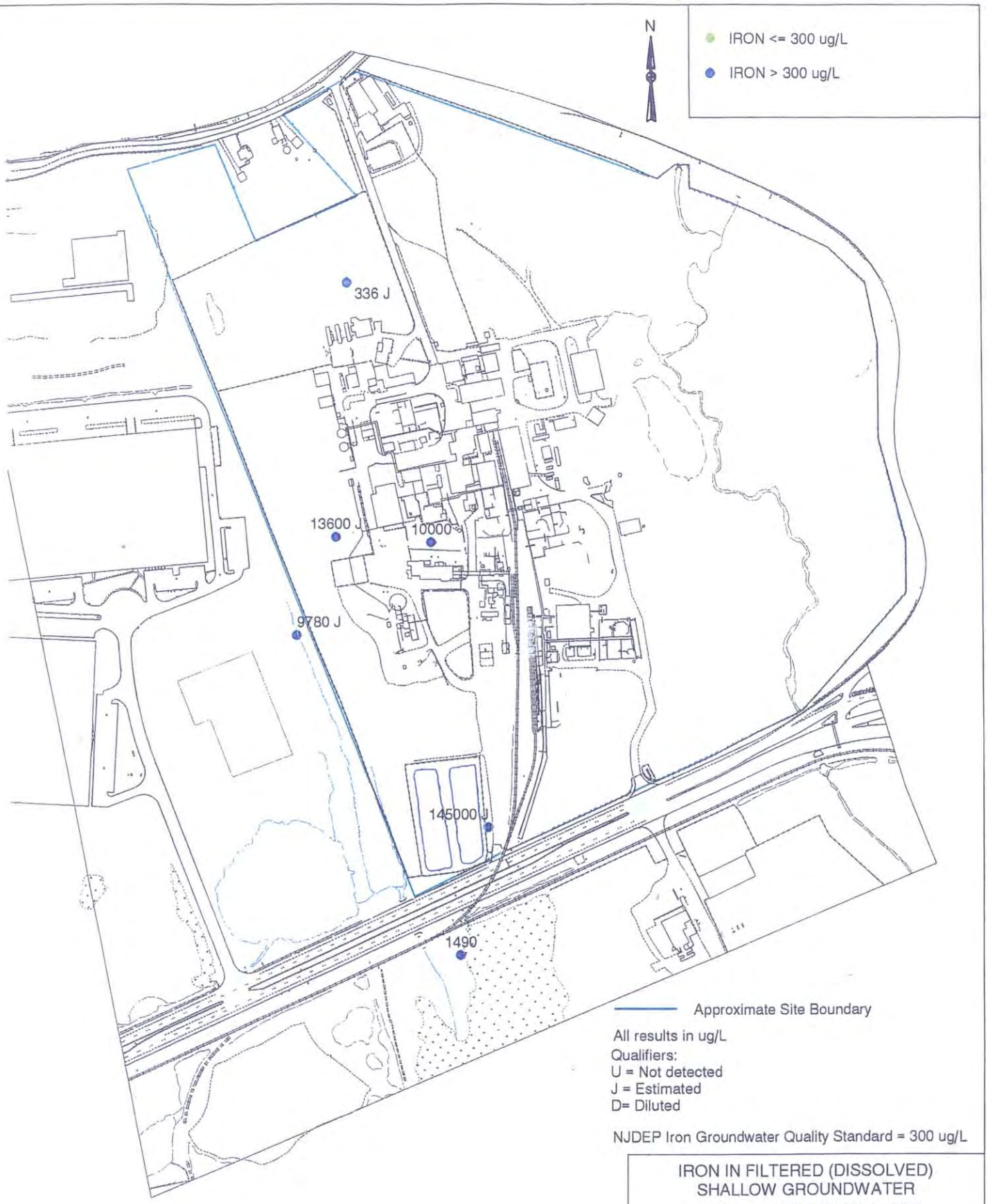
NJDEP Iron Groundwater Quality Standard = 300 ug/L

400 0 400 Feet

IRON IN UNFILTERED
SHALLOW GROUNDWATER
HATCO CORPORATION
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-28



IRON IN FILTERED (DISSOLVED)
SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

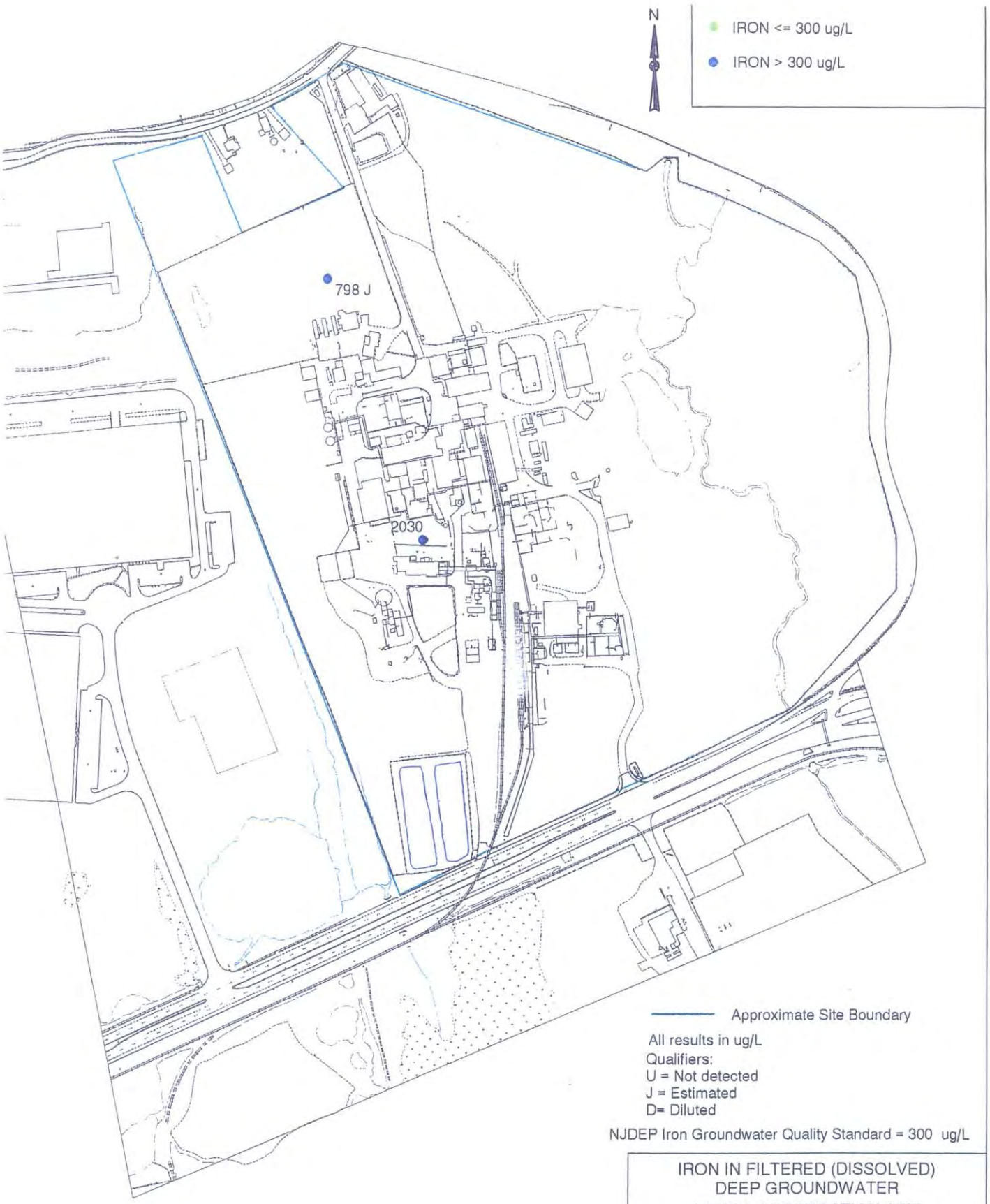
URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-29

IRON IN UNFILTERED
DEEP GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

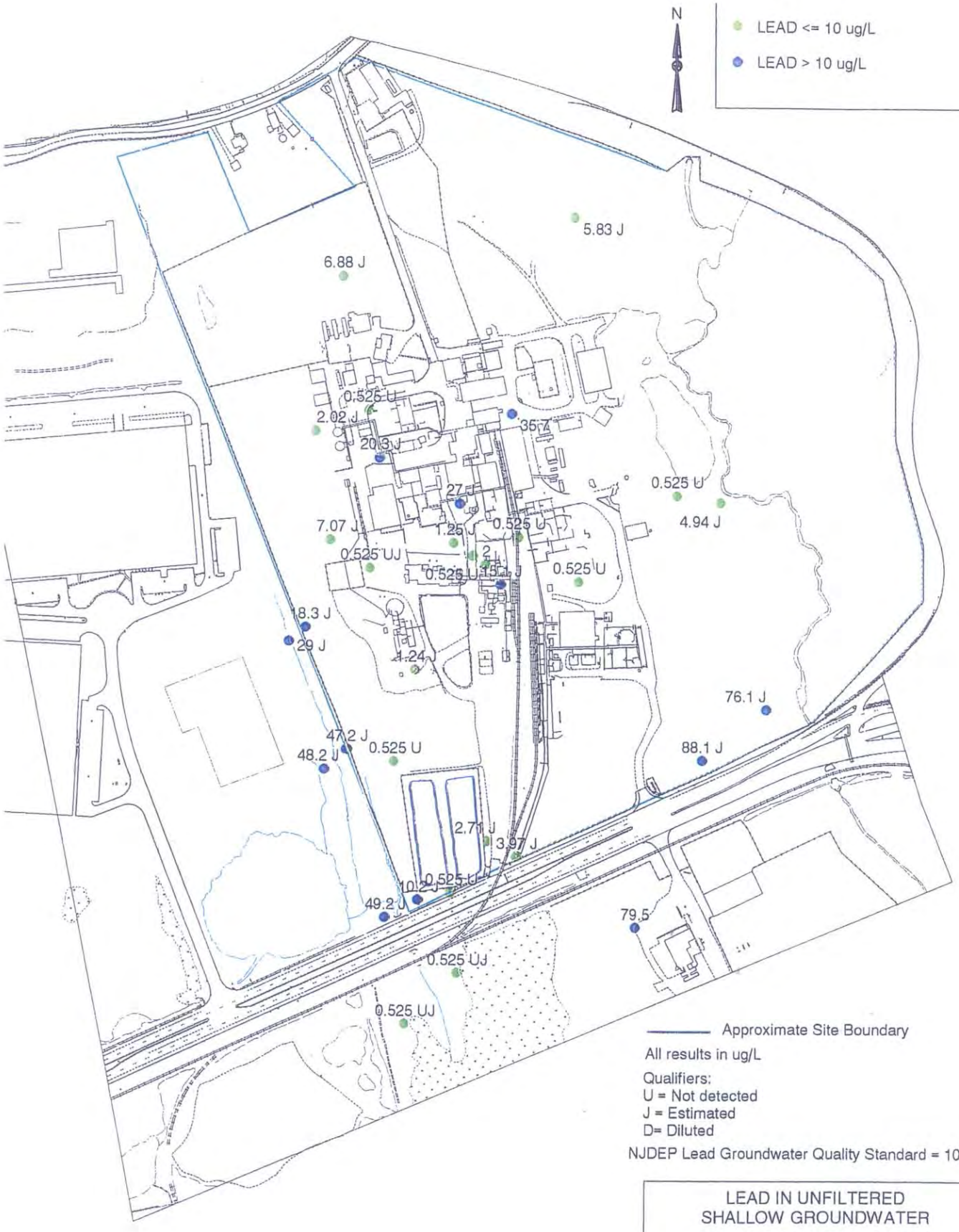
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-30



IRON IN FILTERED (DISSOLVED)
DEEP GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-31

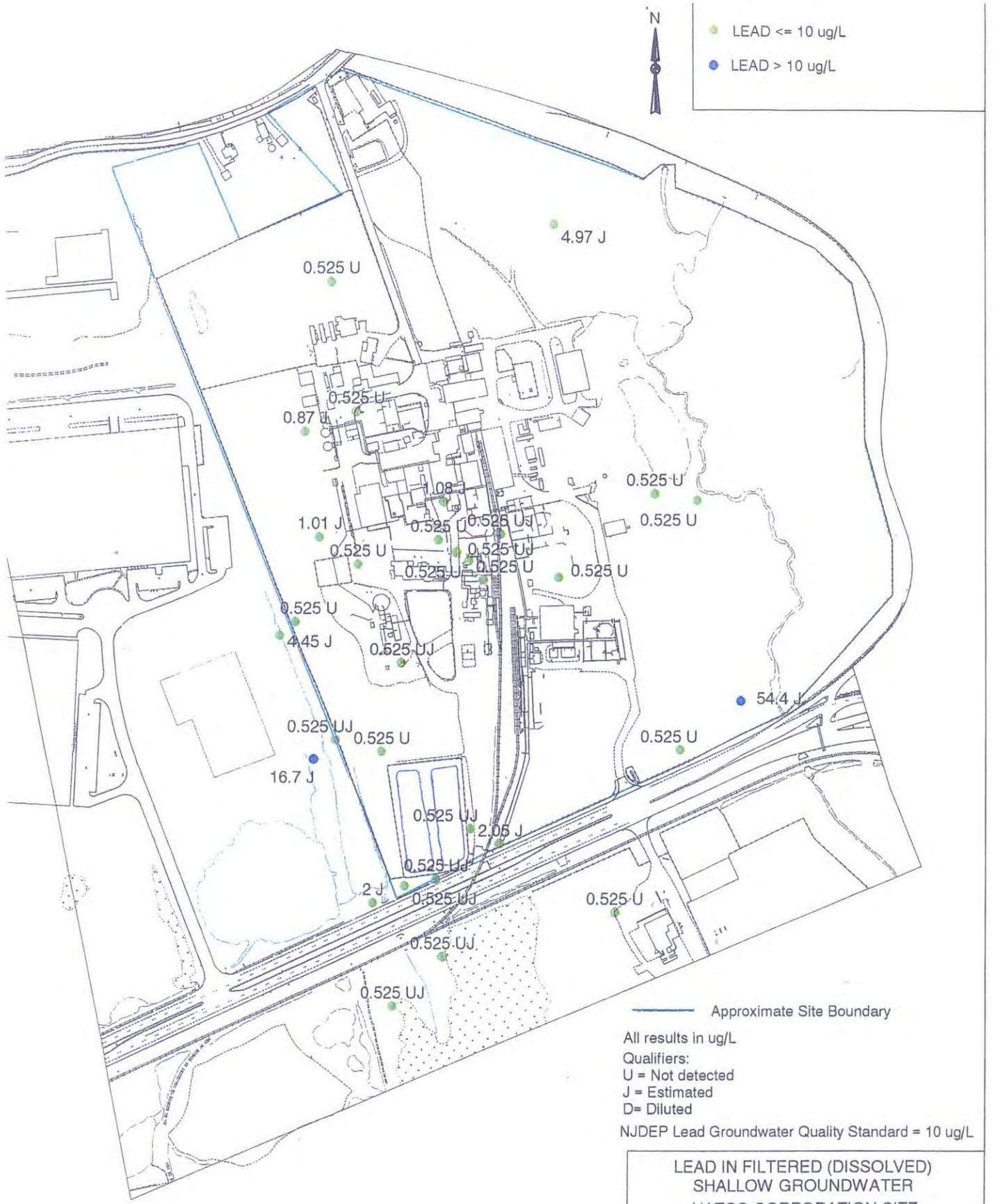


LEAD IN UNFILTERED
SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

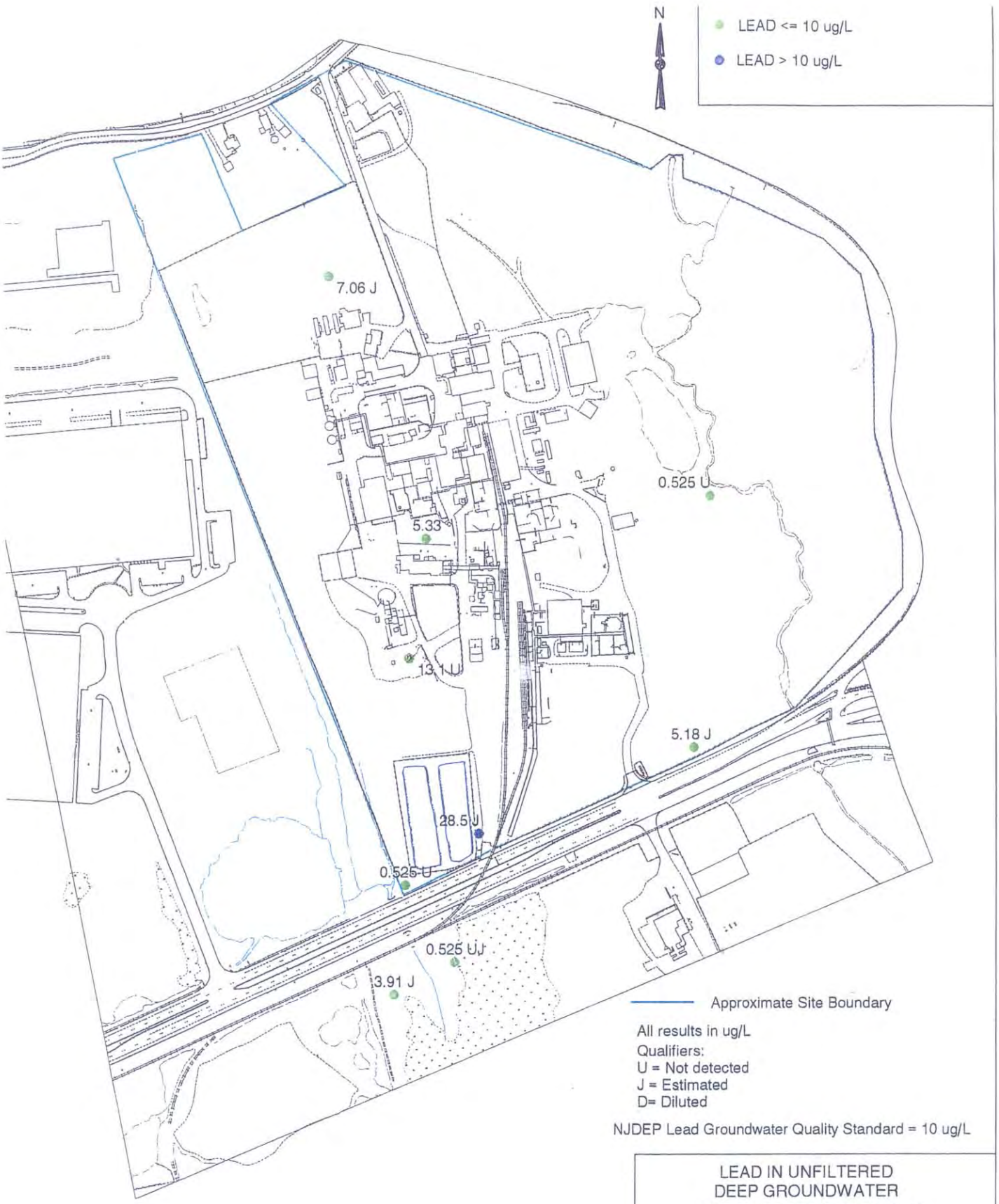
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-32	



LEAD IN FILTERED (DISSOLVED)
SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

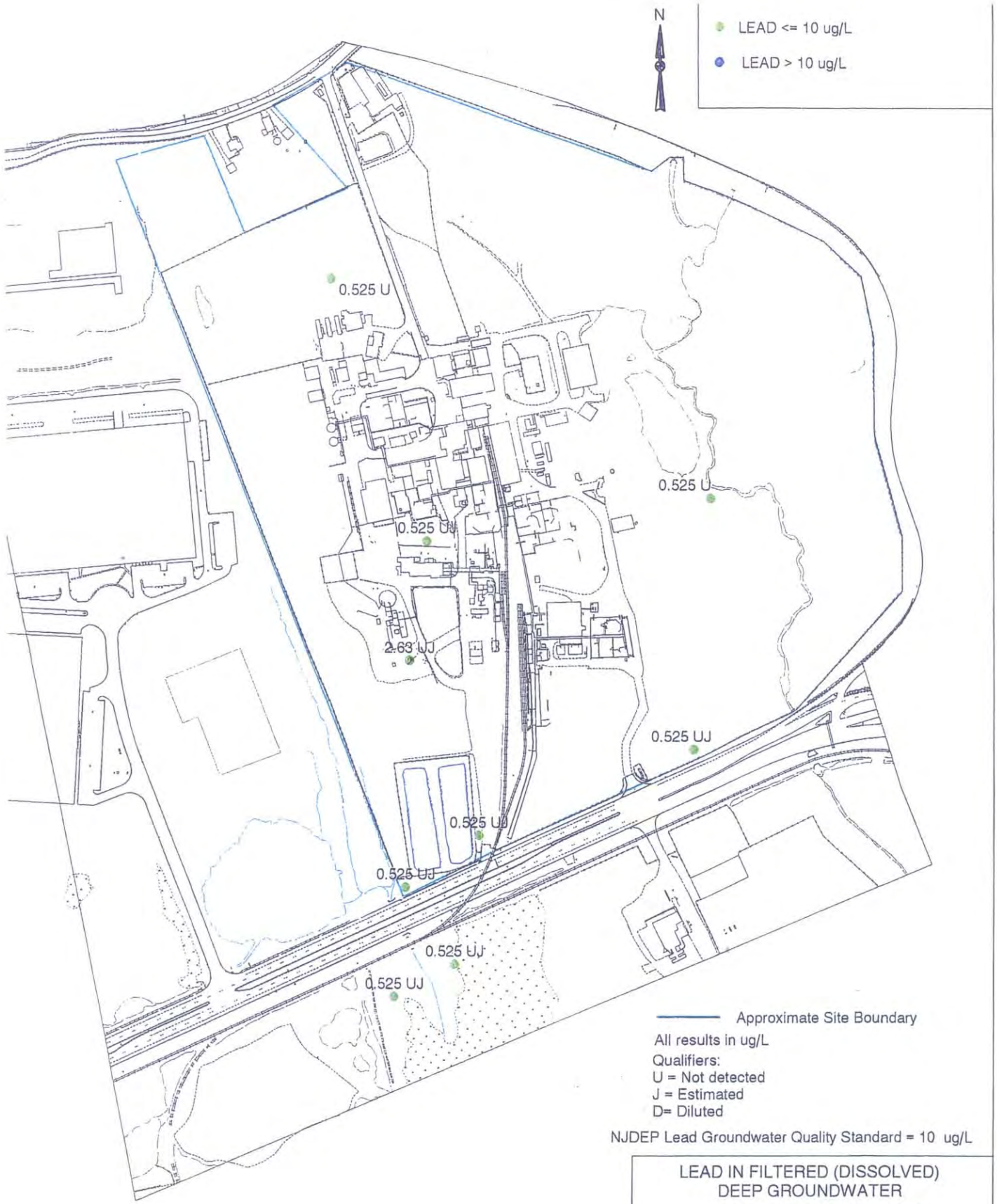
DR. BY RO	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-33



LEAD IN UNFILTERED
DEEP GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-34

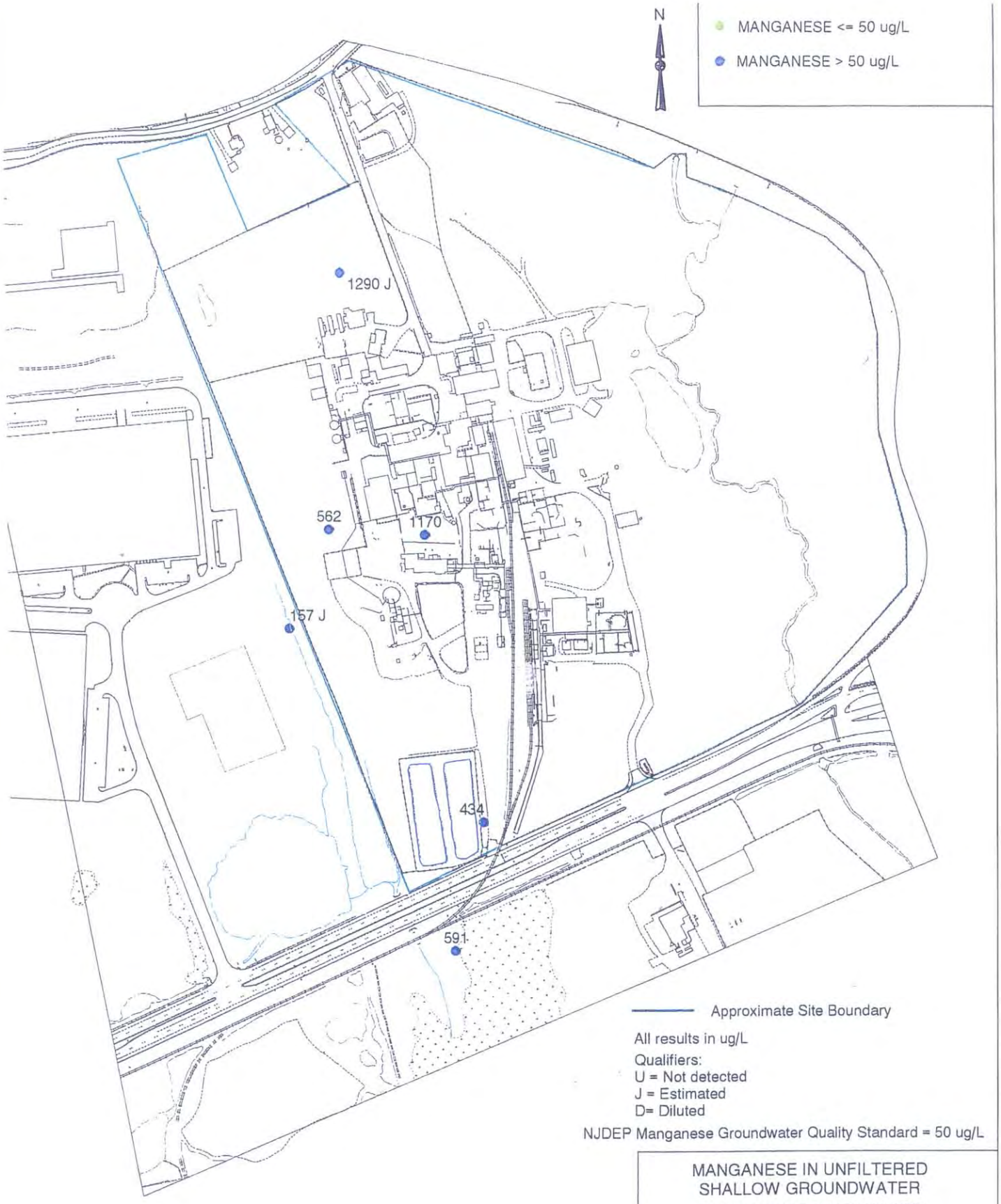


LEAD IN FILTERED (DISSOLVED)
DEEP GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-35	



MANGANESE IN UNFILTERED SHALLOW GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-36

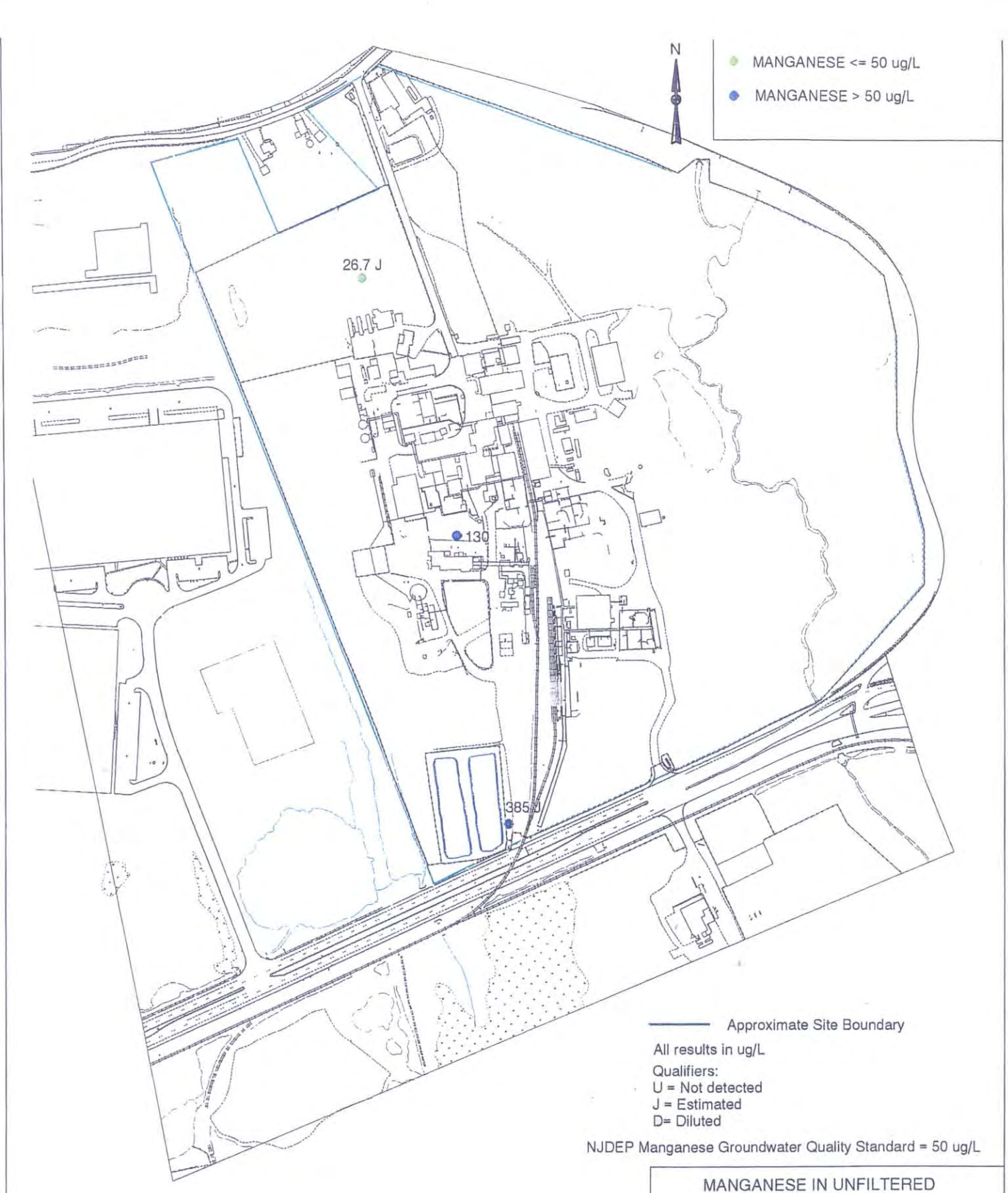
MANGANESE IN FILTERED (DISSOLVED)
SHALLOW GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-37



All results in ug/L

Qualifiers:
U = Not detected
J = Estimated
D= Diluted

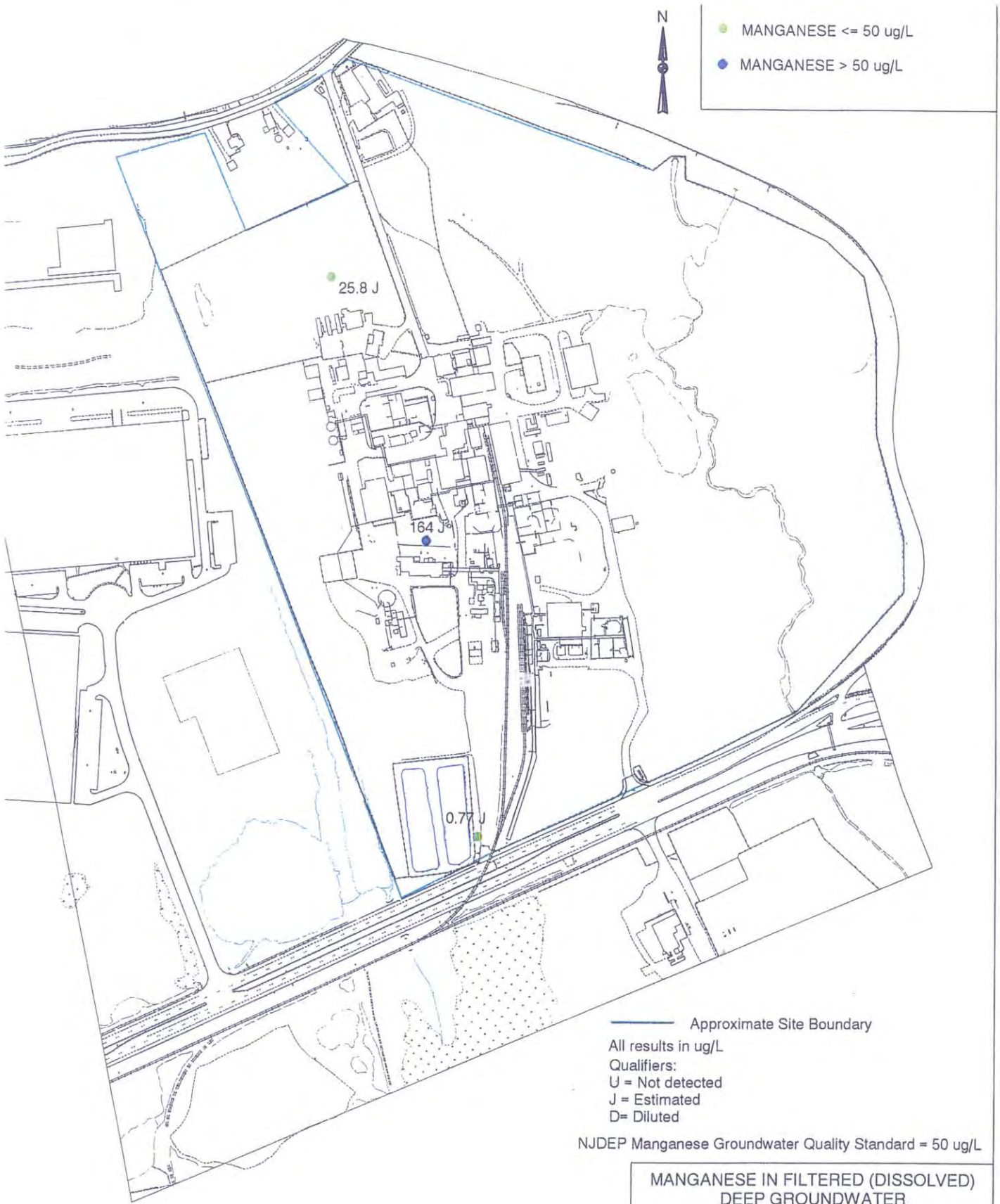
NJDEP Manganese Groundwater Quality Standard = 50 ug/L

400 0 400 Feet

MANGANESE IN UNFILTERED
DEEP GROUNDWATER
W.R. GRACE/HATCO
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-38	

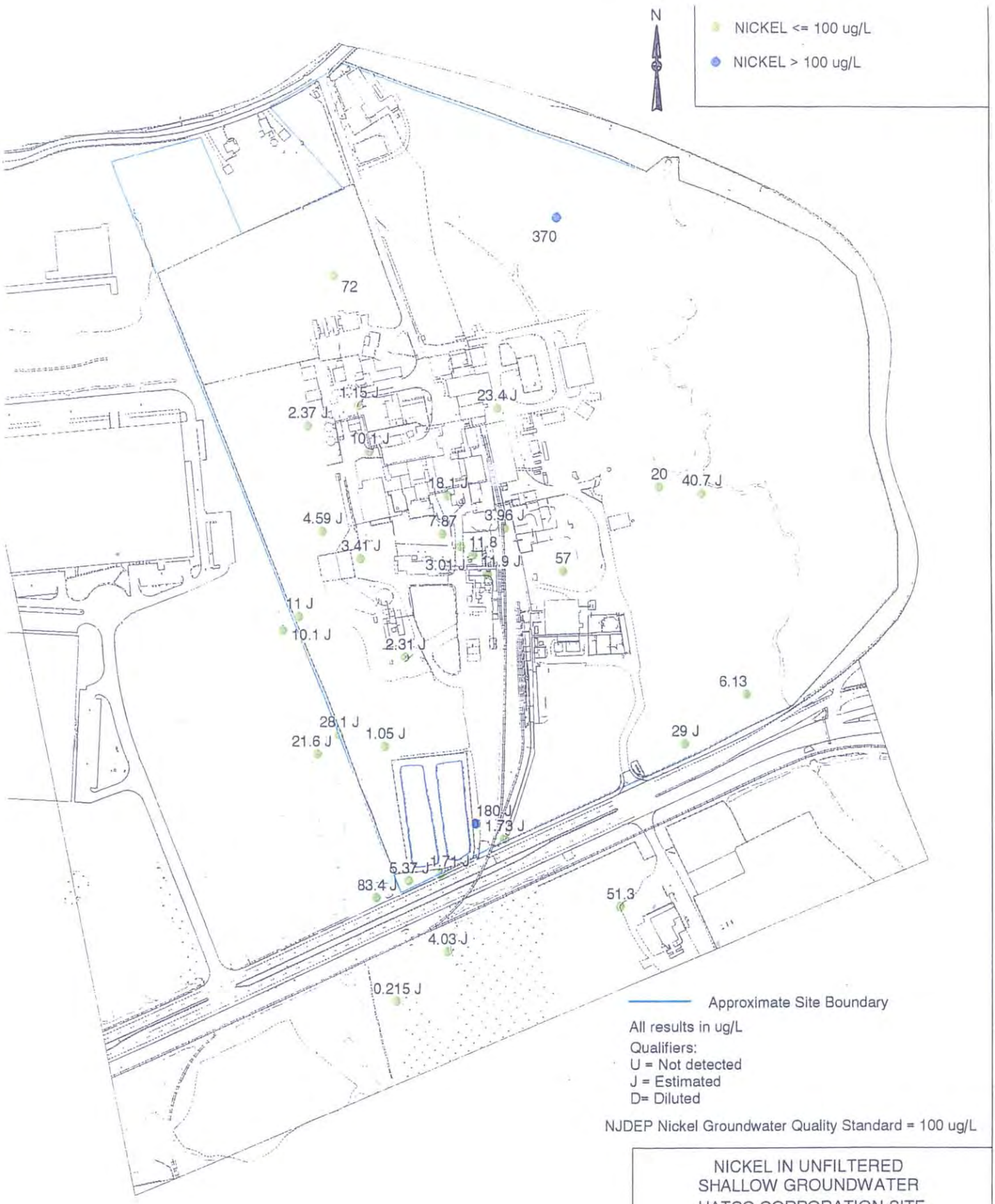


MANGANESE IN FILTERED (DISSOLVED)
DEEP GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-39	

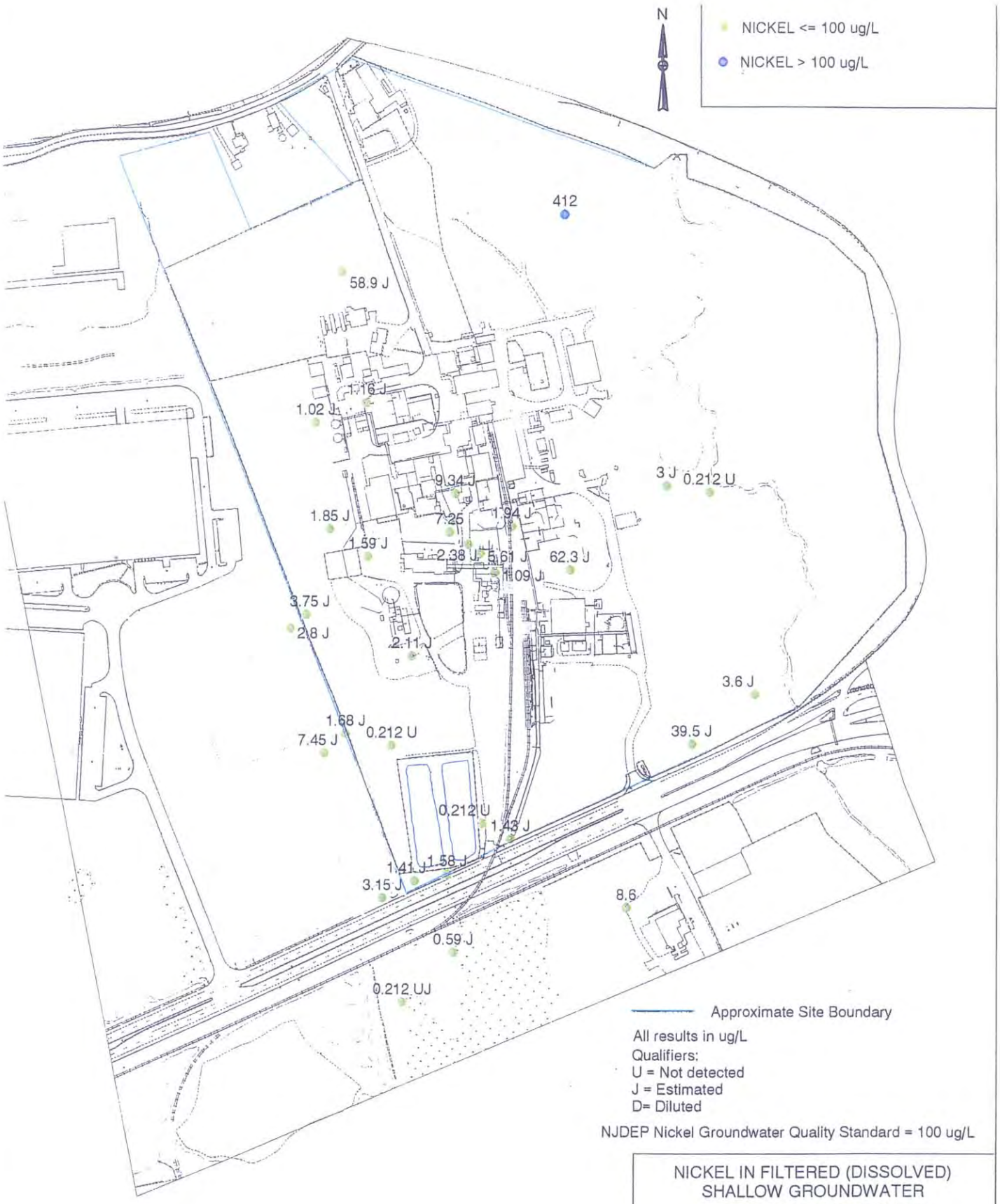


NICKEL IN UNFILTERED
SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-40	



NICKEL IN FILTERED (DISSOLVED)
SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

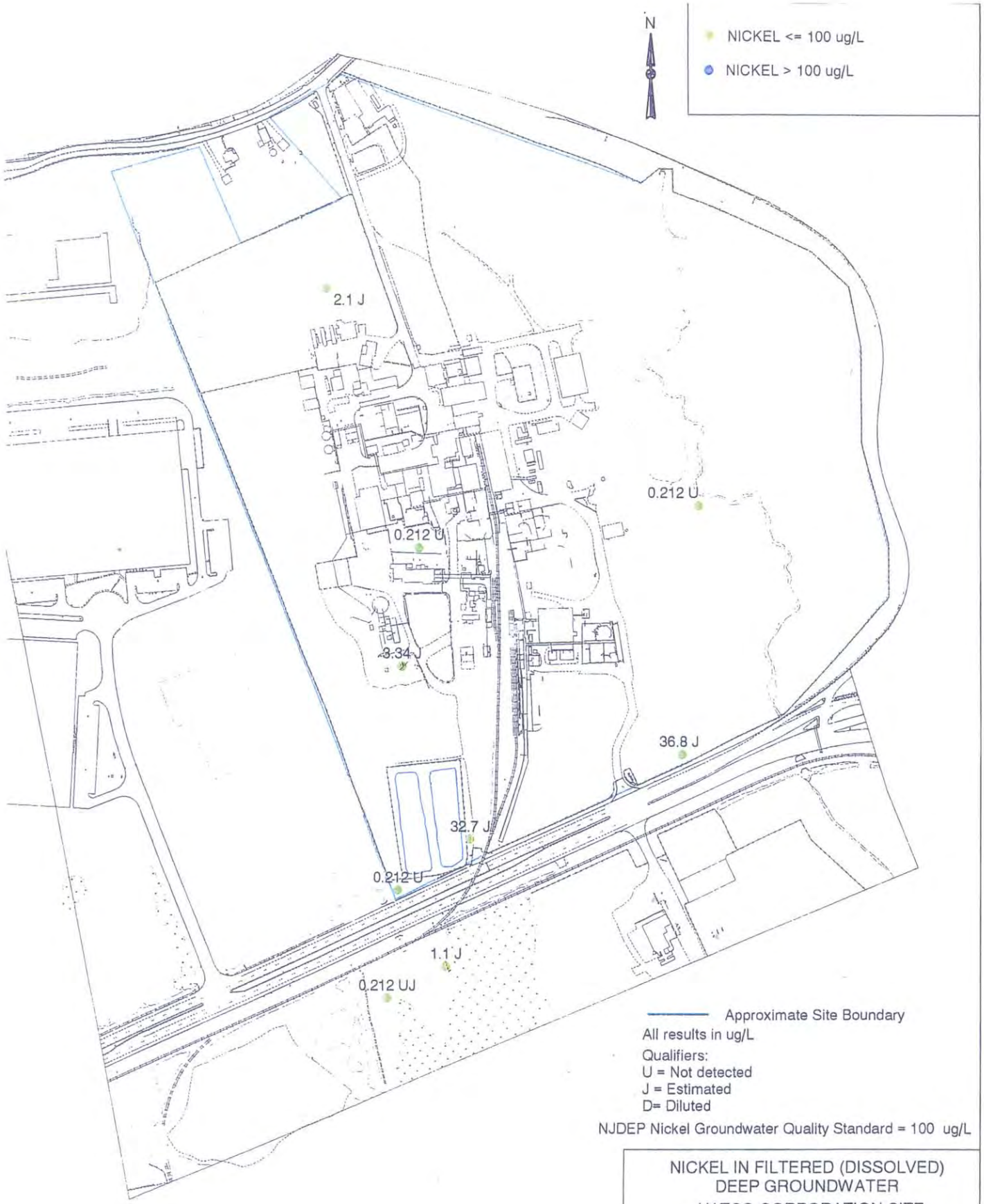
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-41	

NICKEL IN UNFILTERED
DEEP GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-42	



All results in ug/L

Qualifiers:
U = Not detected
J = Estimated
D= Diluted

NJDEP Nickel Groundwater Quality Standard = 100 ug/L

400 0 400 Feet

NICKEL IN FILTERED (DISSOLVED)
DEEP GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-43	

SODIUM IN UNFILTERED
SHALLOW GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-44

All results in ug/L
Qualifiers:
U = Not detected
J = Estimated
D= Diluted

NJDEP Sodium Groundwater Quality Standard = 50,000 ug/L

400 0 400 Feet

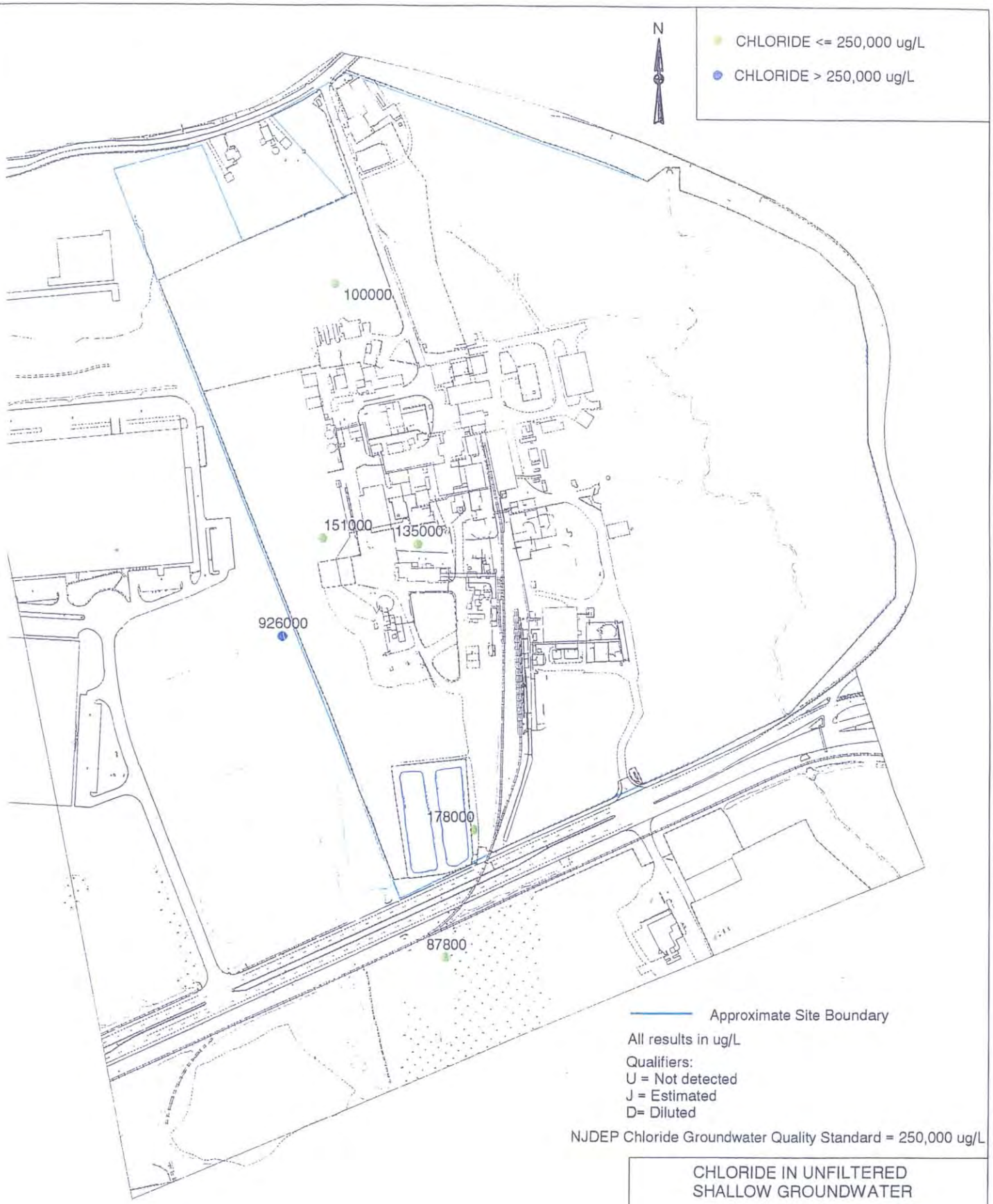
SODIUM IN UNFILTERED DEEP GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. F-45	



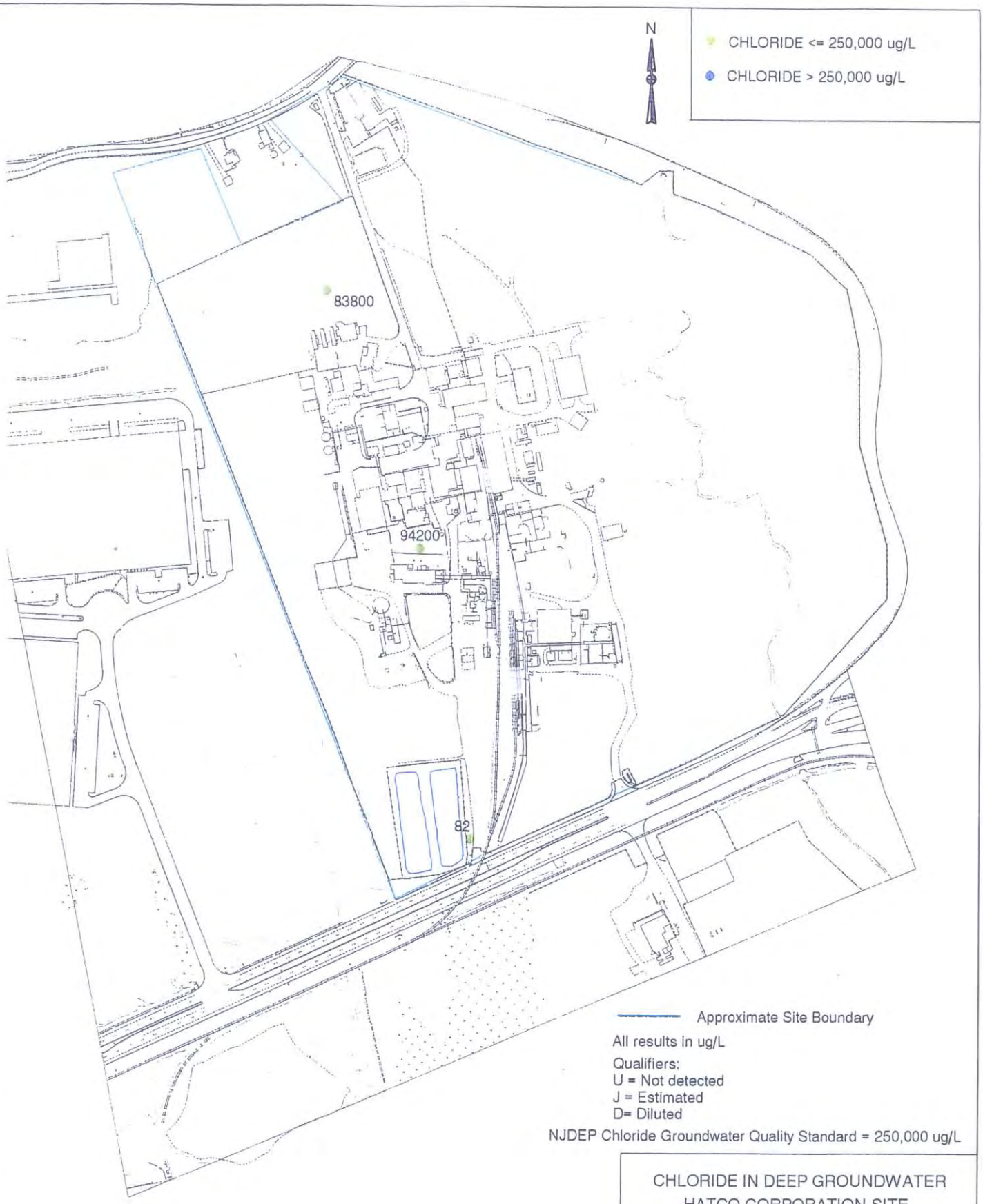
CHLORIDE IN UNFILTERED SHALLOW GROUNDWATER

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-46



CHLORIDE IN DEEP GROUNDWATER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. F-47

APPENDIX G
RECEPTOR EVALUATION

G.1 INTRODUCTION

This section presents an evaluation of potential receptors for exposure to contaminants of concern at the Site. The objective of the evaluation is to identify pathways that could contribute to significant risks to human receptors.

For potential receptors, exposure pathways are considered in the context of a Site Conceptual Exposure Model (SCEM). The SCEM describes potential links between contaminant sources and receptors. It considers potential exposures to contamination at the site and potential transport of contamination from the site to the off-site environment. Figure 3-41 presents the SCEM which considers all potentially significant exposure pathways to contaminants of concern at the Site. Based upon this analysis, Remedial Action Objectives (RAOs) for the Site were developed to provide for control or elimination of any potential exposure pathways that could present significant risks to human health.

Future land use is a consideration in developing an exposure model. The exposure pathways are based on current and expected future non-residential use of the Site. Non-residential use assumes that workers are present at the Site on a routine basis. This use is compatible with the land-use of the adjacent properties.

Four elements are considered in the SCEM in defining exposure pathways. Each element must be present in order for exposure pathways to be considered complete and for contaminants to pose a risk to human health or the environment:

- a source of contamination;
- contaminant transport from the source, through any environmental medium;
- people who may be exposed to contamination (receptors); and
- a point of contact, or exposure route, for contaminants to be taken in by the receptor (e.g., through dermal contact, ingestion and/or inhalation).1 Contaminant Sources

G.2 CONTAMINANT SOURCES

The primary sources of contamination at and associated with the Site include:

- Surface and subsurface contaminated soils, present over much of the operating portion of the Site; and
- Light Non-aqueous Phase Liquids (LNAPL), representing hydrocarbons which are less dense than water, and thus "float" on the groundwater table.

Shallow groundwater at the Site has been impacted by contaminants present in LNAPL and represents a potential secondary source of contaminant exposure. Surface water and sediments in Crows Mill Creek, west of the Site, contain polychlorinated biphenyls (PCBs) likely related to on-site sources and represent potential secondary sources of contaminant exposure. A summary of the distribution of contamination at the Site is provided in Section 3 of the Remedial Action Work Plan (RAWP).

G.3 POTENTIAL RECEPTORS

Human populations at or near the Site have the potential to become exposed to Site contaminants and thus were considered as potential receptors. These populations include:

- Current (or future) workers (on-site and off-site), who are (or will be) present on a routine basis;
- Construction workers (on-site and off-site), who could encounter contaminants on a short-term basis during construction activities such as soil excavation;
- Off-site populations that could be exposed to contaminants from off-site migration via air, surface water, or groundwater; and
- Site visitors or trespassers.

The SCEM (Figure 3-41) illustrates the potential exposure pathways that could link contaminant sources, receptors, and exposure routes. Potential pathways and routes of exposure of these receptors are considered below.

G.4 POTENTIAL EXPOSURE PATHWAYS

G.4.1 Surface Soils

Human exposure to contaminants in surface soil may occur through three primary pathways: direct contact, airborne transport, or surface water transport.

G.4.1.1 Direct Contact

Human exposures to surface soils can occur via direct contact with soils, whereby contaminants may enter the body directly through the skin (dermal contact) or through the mouth (oral ingestion).

Site Workers. Site workers may occasionally be exposed to surface soils during routine work and maintenance activities. Substantial potential exposures to workers through direct contact would generally be limited to activities in unpaved or uncovered areas of the Site that involve some contact with soils (material handling, maintenance or excavation).

Construction Workers. Workers may be exposed to surface soils through non-routine construction, emergency repair, or maintenance activities that involve excavating soils. These could include Site employees or contract workers.

Local Residents/Trespassers. Local residents would only be directly exposed to surface soils through trespass activities. Trespass incidents are limited by normal Site security. The Site is secured by a 6-ft high chain-link fence. No routine exposure to young children is expected because of normal Site security procedures. Site workers and construction workers have greater potential to result in significant exposure to soils than trespassers. Thus, remedial action protective of workers will be protective of potential trespassers.

G.4.1.2 Airborne Transport

Site workers and nearby off-site residents could theoretically be exposed to contamination in surface soils via airborne dispersion of fugitive dust (airborne soil particles) or organic vapors volatilized from the soil. No significant volatile organic compounds (VOCs) have been detected in surface soils thus airborne vapor migration does not represent a potential exposure pathway. Normal operations at the facility are conducted on paved or gravel-covered areas and have limited potential to generate fugitive dust. The remedy for the Site should include provisions to insure that fugitive dust will not be generated from contaminated areas during construction work.

G.4.1.3 Surface Water Transport

Contaminants in surface soils may potentially migrate off-site via surface water runoff, either dissolved or as suspended particulate matter. Runoff from the Site has impacted Crows Mill Creek. Potential exposures for this area are discussed in Section G3.4.

G.4.1.4 Summary - Surface Soils

Potential exposures that could occur would be limited primarily to Site workers or construction workers engaged in maintenance work or other activities which may result in direct contact with soils. Local residents are not expected to have significant exposure to surface soils. Except for construction work, airborne exposures pathways are not considered significant based on the absence of VOCs in surface soils and the limited potential for fugitive dust generation. Surface water runoff from the Site has impacted Crows Mill Creek.

Based upon this analysis, the remedy should provide for the following:

- control of potential exposure of workers via direct contact with surface soils;
- control of potential for airborne transport of fugitive dust from contaminated areas during construction work; and
- control of potentially contaminated surface water runoff from the Site to Crows Mill Creek.

G.4.2 Exposure Pathways - Subsurface Soils

Human exposure to contaminants in subsurface soils may occur through three primary pathways: direct contact, airborne transport, or leaching to groundwater. Site workers engaged in routine activities would not be expected to have any significant exposure to subsurface soils. The primary potential for human exposure to subsurface soils is through potential future construction activities which would disturb contaminated subsurface soils.

G.4.2.1 Direct Contact

Direct contact exposure (dermal contact, ingestion and/or inhalation) could occur to future construction workers if appropriate personnel protection is not in place during construction. Because of the non-residential use of the Site (now and expected in the future) no other populations are expected to have significant exposure to subsurface soil.

G.4.2.2 Airborne Transport

Construction workers could be exposed to airborne contamination (fugitive dust) during construction activities if proper protection is not employed. Depending on the scope of construction activities, it is also possible, although unlikely, that other Site workers or nearby residents and/or workers could be exposed to airborne dust if proper precautions are not employed.

G.4.2.3 Leaching

Groundwater flow through the Site and rainwater infiltration and percolation through surface and subsurface soil may leach contaminants into groundwater. Groundwater transport and exposure pathways are discussed in Section G3.3.

G.4.2.4 Summary - Subsurface Soil

Direct exposure to contaminants in subsurface soil would generally be limited to future construction workers who may disturb contaminated soils during excavation. Airborne transport of contaminants during uncontrolled construction activities could also result in airborne exposure to Site workers or nearby residents.

Based upon this analysis, the remedy should provide for the following:

- control of potential exposure of workers via direct contact with subsurface soils; and
- control of potential for airborne transport of fugitive dust from subsurface contaminated areas during construction work.

G.4.3 GROUNDWATER RELATED PATHWAYS, INCLUDING LNAPL

G.4.3.1 Groundwater

The primary human health concern associated with groundwater contamination is the use of groundwater as a potable water supply. Humans who use groundwater as potable water could be exposed by drinking water (ingestion) or bathing and showering (direct contact or inhalation of volatile organics). The Site and its vicinity are served by a public water supply. There are no known users of groundwater within a one-mile radius of the Site. Moreover, any off-site wells would not be impacted by groundwater contamination related to the Site, as demonstrated by modeling of potential groundwater migration. Thus, no direct human exposure to contaminated groundwater from the Site is occurring at present and none is anticipated.

G.4.3.2 LNAPL

LNAPL at the Site represents a residual source of groundwater contamination in the immediate vicinity of the LNAPL plume. However, because groundwater is not used as a potable water supply in the Site vicinity, LNAPL does not represent a source of exposure via groundwater ingestion.

Incidental exposure to LNAPL and/or any associated contaminated groundwater could occur for construction workers if they excavate soils to the groundwater table in areas where LNAPL is present. If this occurs, exposure could occur via direct contact or inhalation of vapors. Provision of proper controls during construction activities will be required to prevent exposure to Site contaminants in LNAPL during construction activities. There is limited potential for exposure of on-site workers or trespassers to LNAPL. Potential exposure would be limited to contact with uncontrolled LNAPL surface seeps. There are no known uncontrolled seeps.

There is no potential for incidental exposure to groundwater or LNAPL for off-site populations. Surface water monitoring data in the creek indicate low concentrations of polychlorinated biphenyls (PCBs) in unfiltered surface water (See Section 3 of the RAWP), that could represent resuspended sediment particles, surface water runoff or impact of LNAPL sheen. Potential for exposure in Crows Mill Creek is discussed in Section G3.4.

G.4.3.3 Summary – Groundwater and LNAPL

Under current conditions, direct exposure to contaminated groundwater is not expected because there are no receptors. The area within the vicinity of the Site is supplied with public water. No potable water supply wells are located within a one-mile radius of the Site. Potential exposure to contaminated groundwater and LNAPL could occur during construction activities.

Based upon this analysis, the remedy should provide for the following:

- control of potential exposure of workers via direct contact with contaminated groundwater and LNAPL; and
- control of potential exposure via ingestion of contaminated groundwater.

G.4.4 Surface Water and Sediment Pathways

G.4.4.1 Potential Exposure

Contaminants from the Site have impacted Crows Mill Creek sediments via surface water runoff. Crows Mill Creek is a small stream, classified as FW2-NT - a freshwater body not suitable for trout species. Due to its small size, it does not represent a potential source of drinking water or a source of fish for human consumption. Thus, potential human exposures would be limited to occasional secondary contact (e.g., wading) by workers or trespassers. Exposure could occur via dermal contact or incidental ingestion of surface water or sediment. Such exposures are likely to be of very limited frequency and duration, because the creek is in an industrial area and does not represent an attractive recreational resource.

G.4.4.2 Summary - Surface Water and Sediment

Human exposures via surface water for Crows Mill Creek could occur via dermal contact or incidental ingestion, although such exposures are likely to be of limited frequency and duration.

Based upon this analysis, the remedy should provide for the following:

- control of potential exposure of workers/trespassers via direct contact with Crows Mill Creek sediments; and

- control of potentially contaminated surface water runoff to Crows Mill Creek, to prevent potential for recontamination of the creek.

G.5 REMEDIAL ACTION OBJECTIVES

Based upon an evaluation of current and potential future exposure pathways, the RAOs developed to protect human health are summarized as follows:

Surface Soils:

- control of potential exposure of workers via direct contact with surface soil;
- control of potential for airborne transport of fugitive dust from contaminated areas during construction work; and
- control of potentially contaminated surface water runoff from the Site to Crows Mill Creek.

Subsurface Soils:

- control of potential exposure of workers via direct contact with subsurface soils; and
- control of potential for airborne transport of fugitive dust from subsurface contaminated areas during construction work.

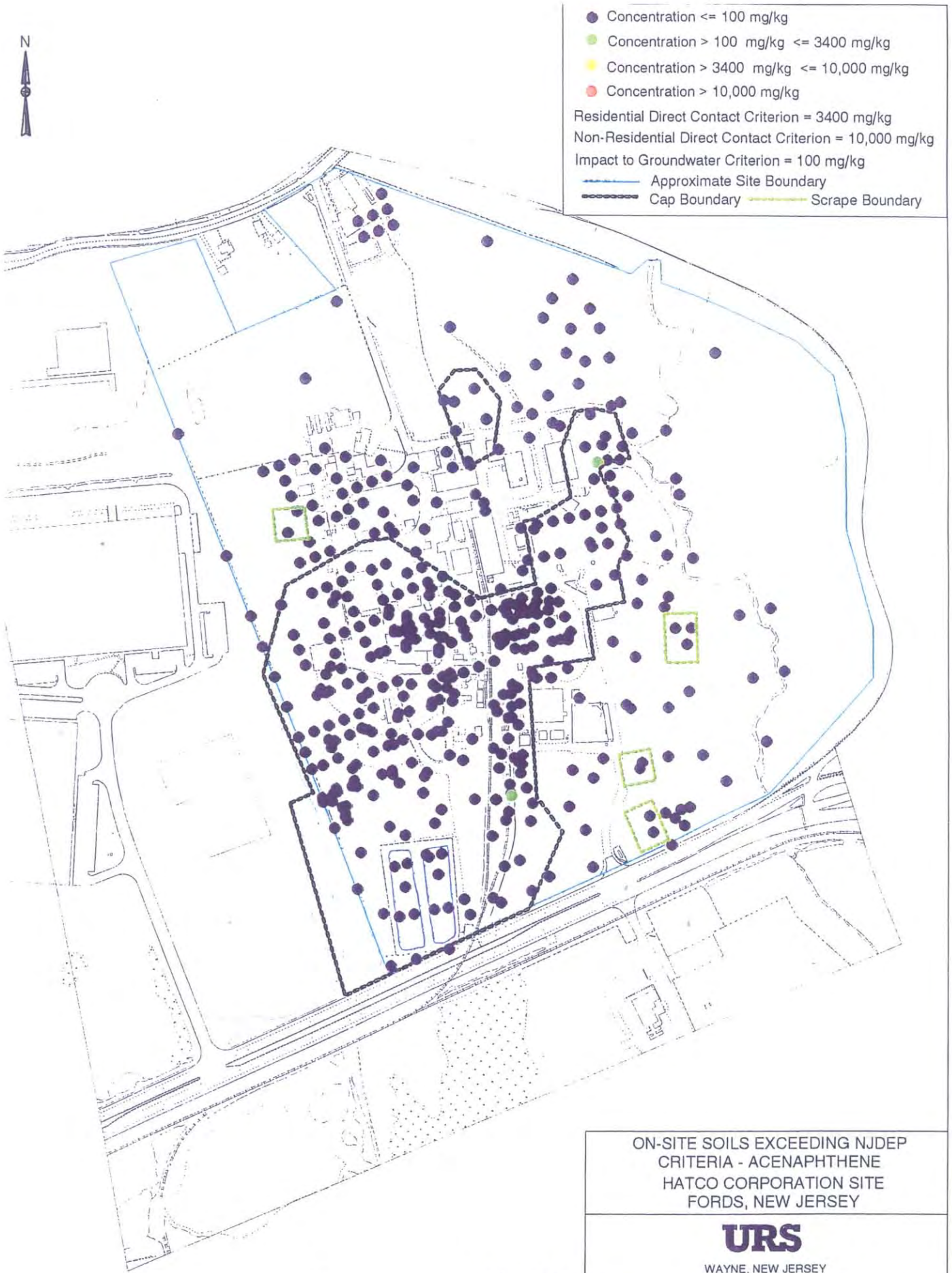
Groundwater and LNAPL:

- control of potential exposure of workers via direct contact with contaminated groundwater and LNAPL; and
- control of potential exposure via ingestion of contaminated groundwater.

Surface Water and Sediment:

- control of potential exposure of workers/ trespassers via direct contact with Crows Mill Creek sediments; and
- control of potentially contaminated surface water runoff to Crows Mill Creek, to prevent potential for recontamination of the creek.

LIST OF FIGURES

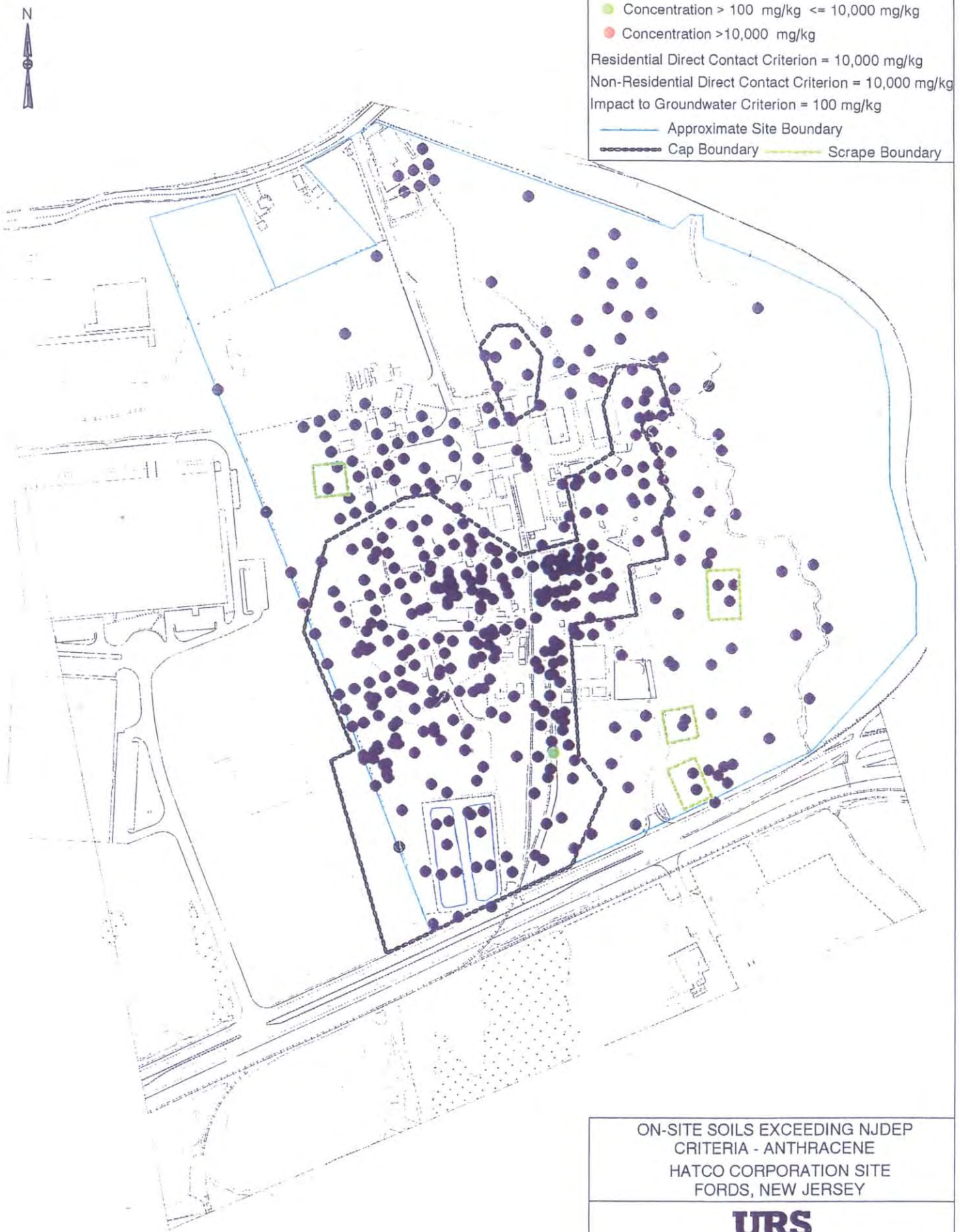


ON-SITE SOILS EXCEEDING NJDEP CRITERIA - ACENAPHTHENE
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. I-1	



ON-SITE SOILS EXCEEDING NJDEP CRITERIA - ANTHRACENE

HATCO CORPORATION SITE

FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: JULY 30, 1999	FIG. NO. I-2	

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - ANTIMONY

HATCO CORPORATION SITE

FORDS, NEW JERSEY

URS

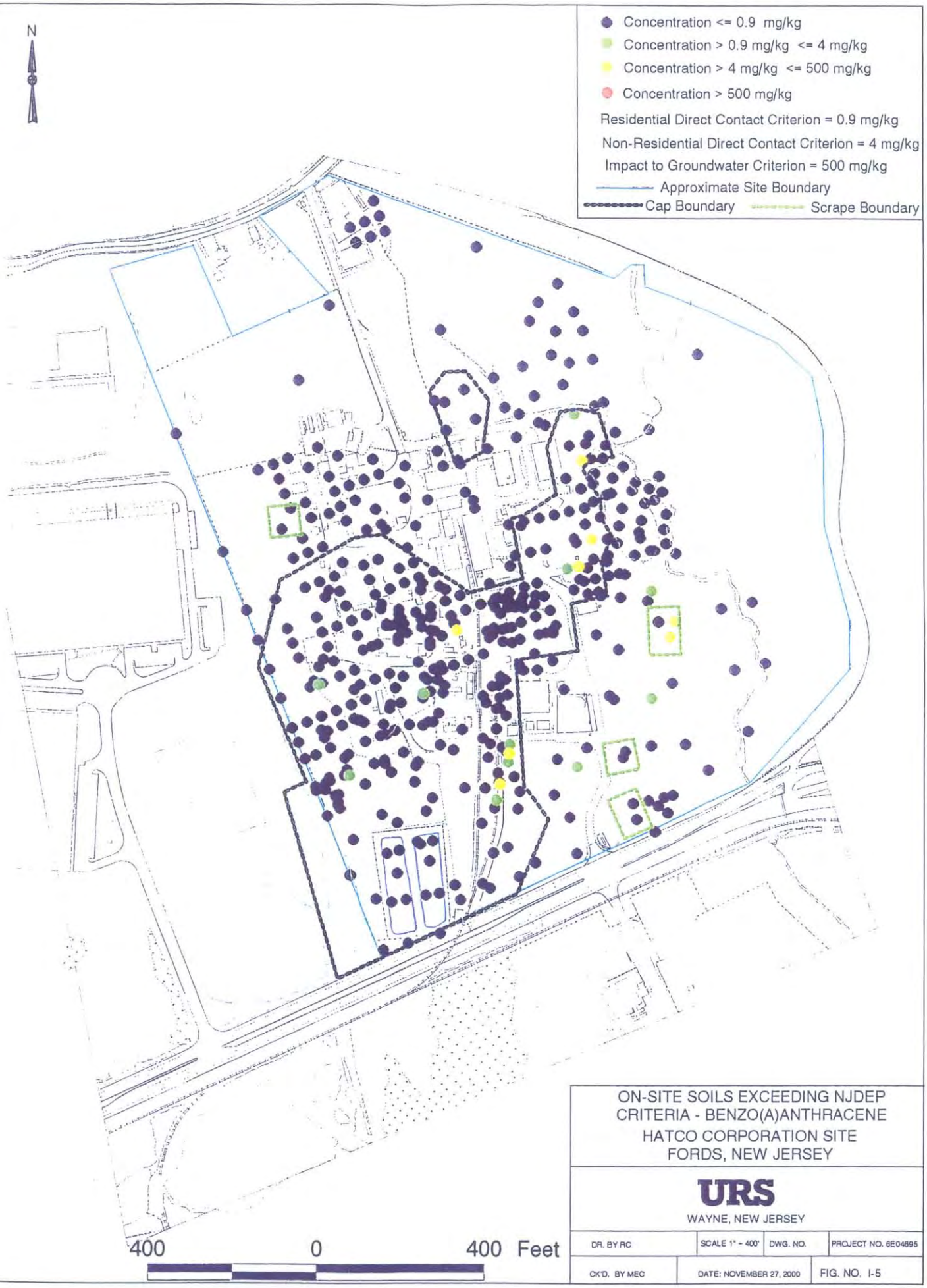
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. I-3	

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - BARIUM
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. 1-4	



ON-SITE SOILS EXCEEDING NJDEP CRITERIA - BENZO(A)ANTHRACENE
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

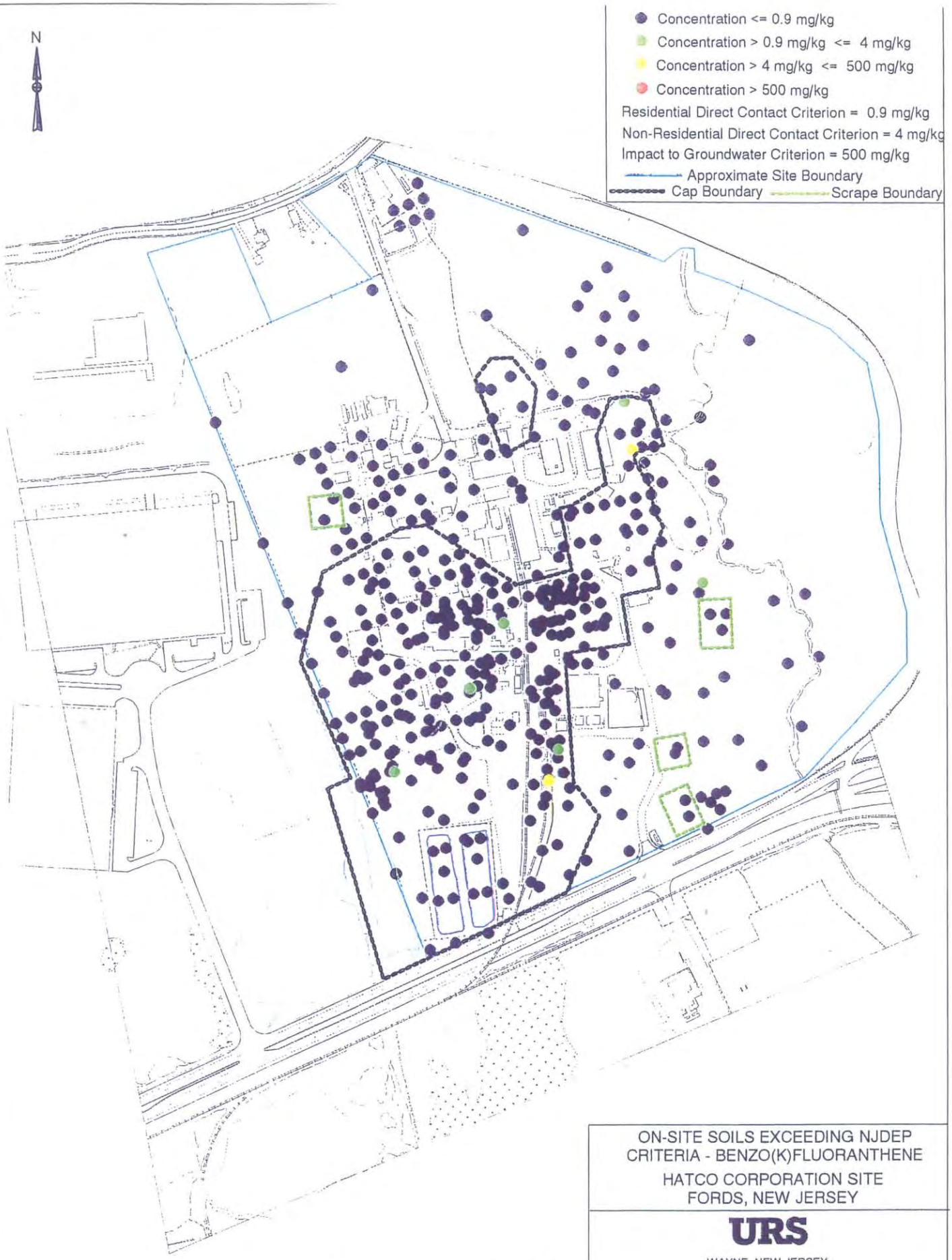
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. I-5	

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - BENZO(B)FLUORANTHENE
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. 1-6	



ON-SITE SOILS EXCEEDING NJDEP CRITERIA - BENZO(K)FLUORANTHENE

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

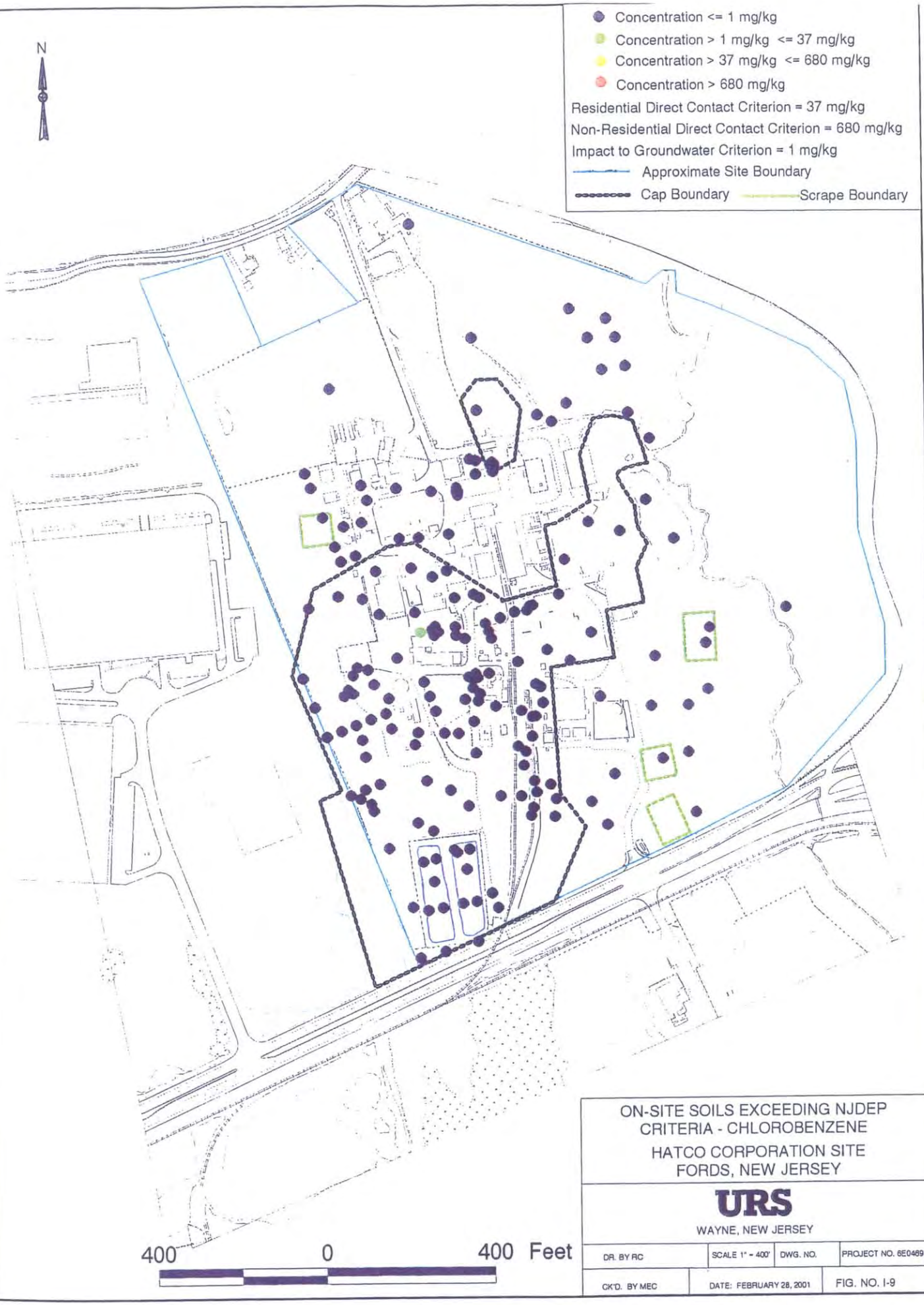
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. 1-7	

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - BERYLLIUM
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. 1-8



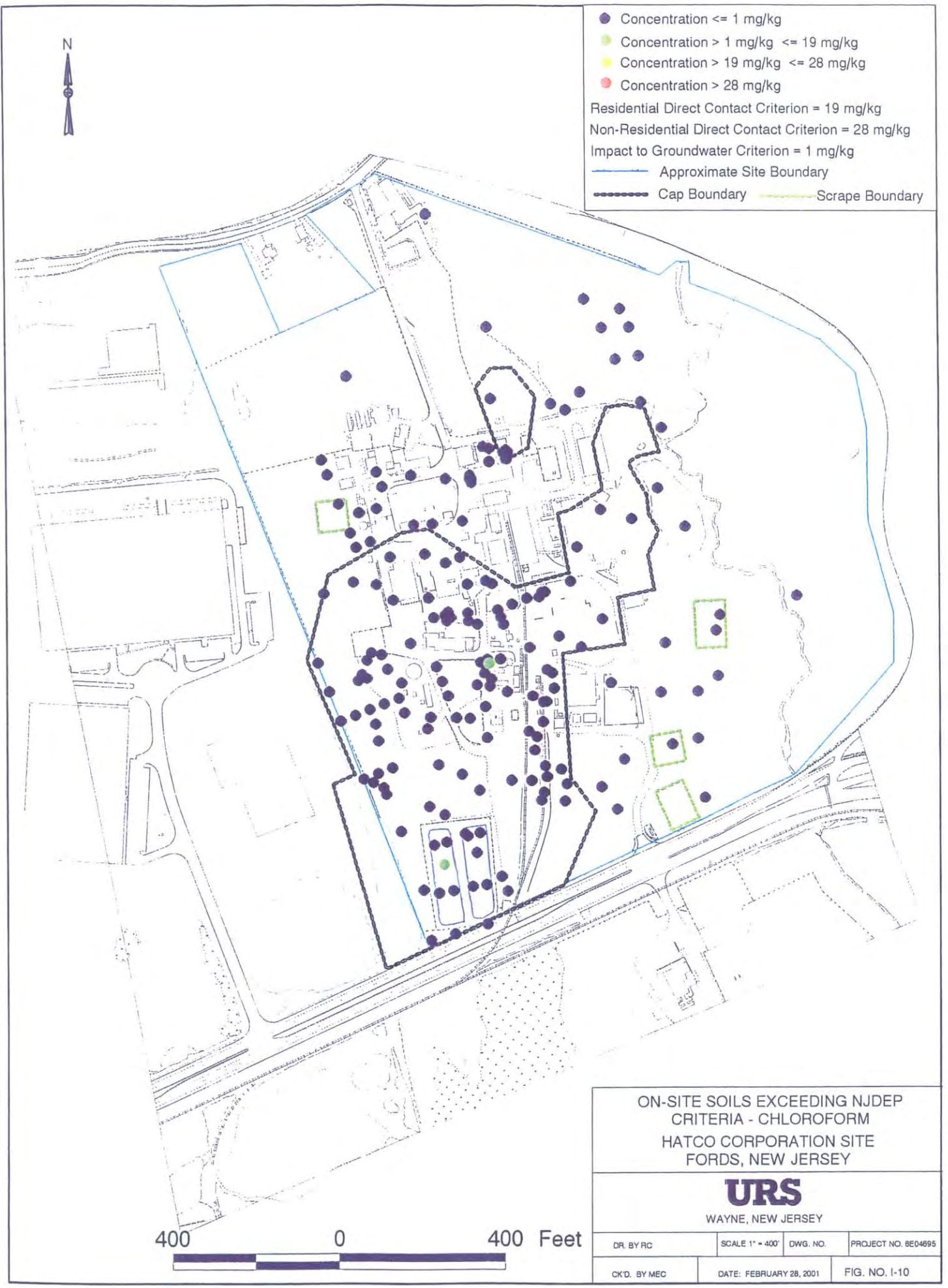
ON-SITE SOILS EXCEEDING NJDEP CRITERIA - CHLOROBENZENE

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 28, 2001	FIG. NO. I-9	



ON-SITE SOILS EXCEEDING NJDEP CRITERIA - CHLOROFORM

HATCO CORPORATION SITE

FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04695
CK'D. BY MEC	DATE: FEBRUARY 28, 2001		FIG. NO. I-10

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - CHROMIUM

HATCO CORPORATION SITE

FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. I-11

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - CHRYSENE
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

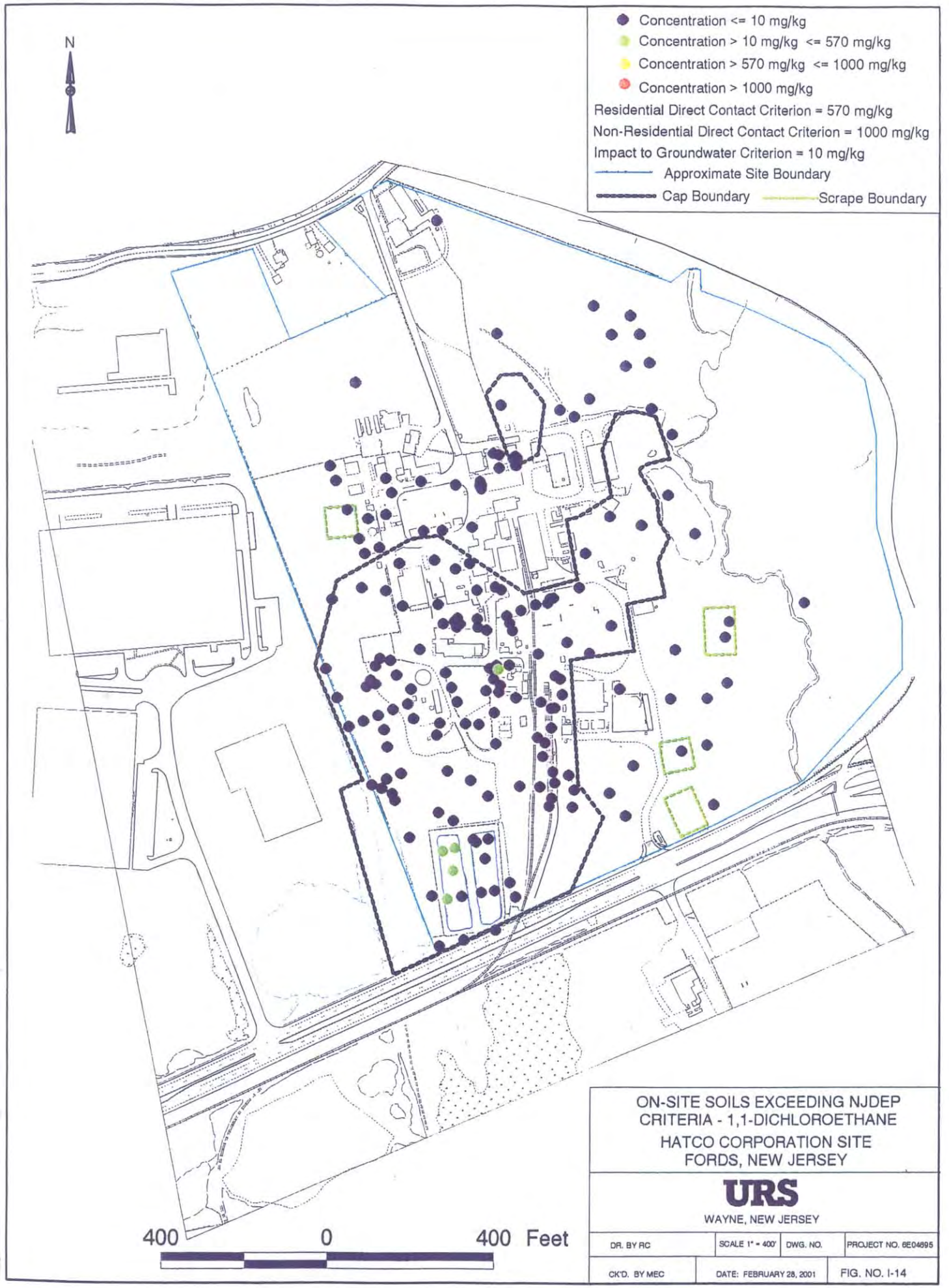
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. I-12

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - COPPER
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. I-13	



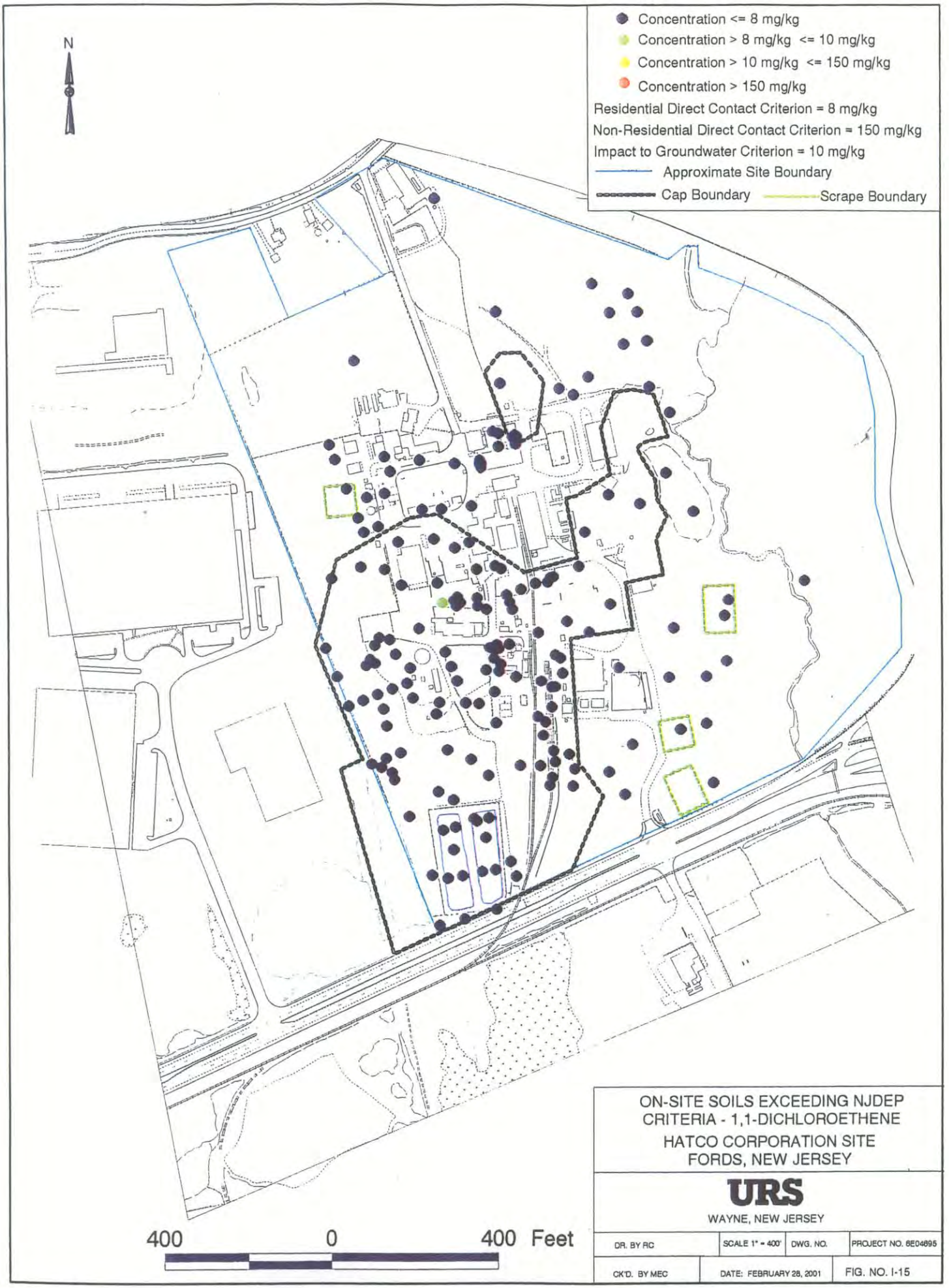
ON-SITE SOILS EXCEEDING NJDEP CRITERIA - 1,1-DICHLOROETHANE

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 28, 2001		FIG. NO. I-14



ON-SITE SOILS EXCEEDING NJDEP CRITERIA - 1,1-DICHLOROETHENE

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
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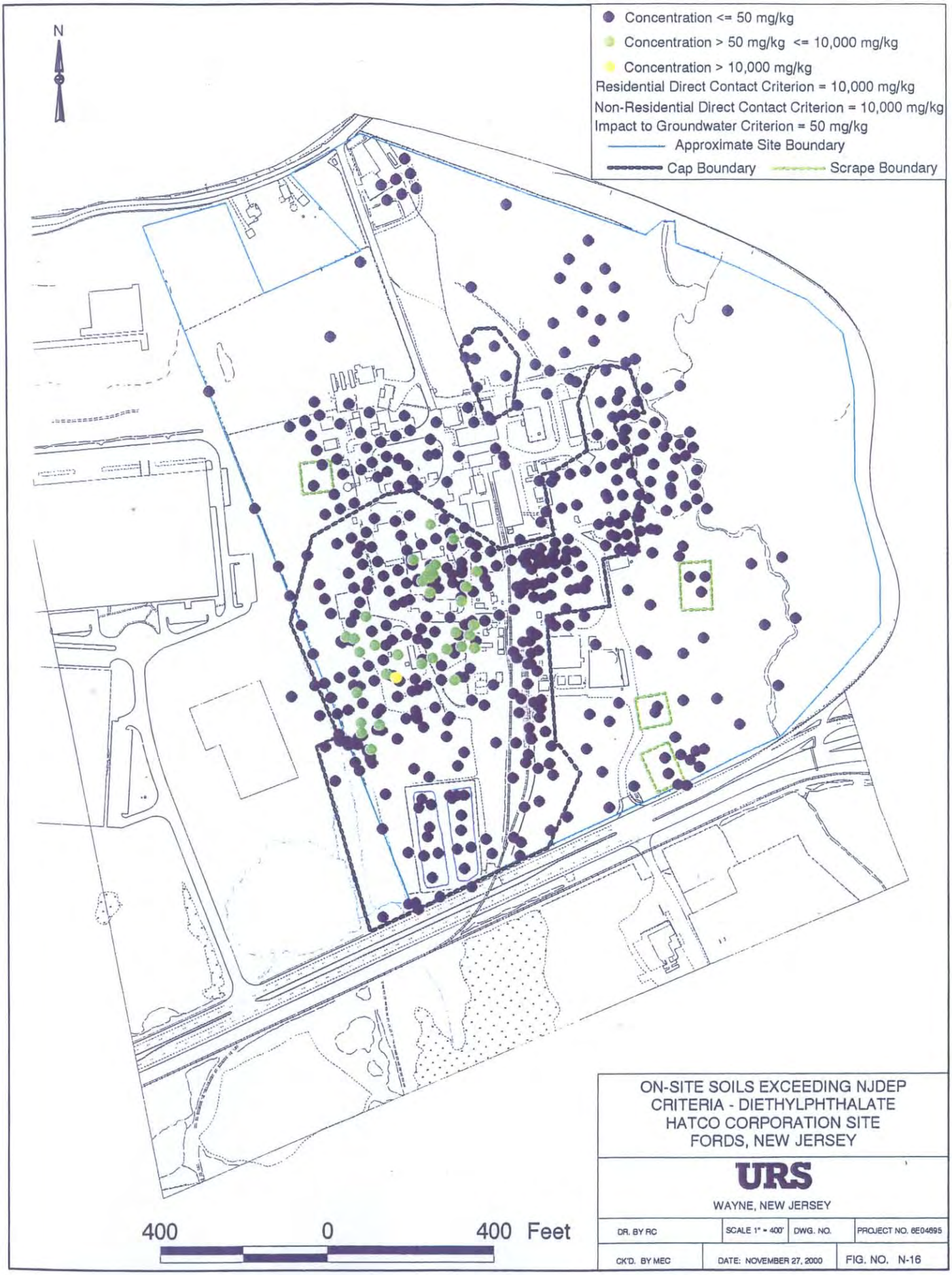

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - DIETHYLPHTHALATE
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. N-16	

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - DI-n-BUTYLPHTHALATE
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. 1-17	

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - DIMETHYLPHTHALATE
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. I-18	

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - FLUORANTHENE
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
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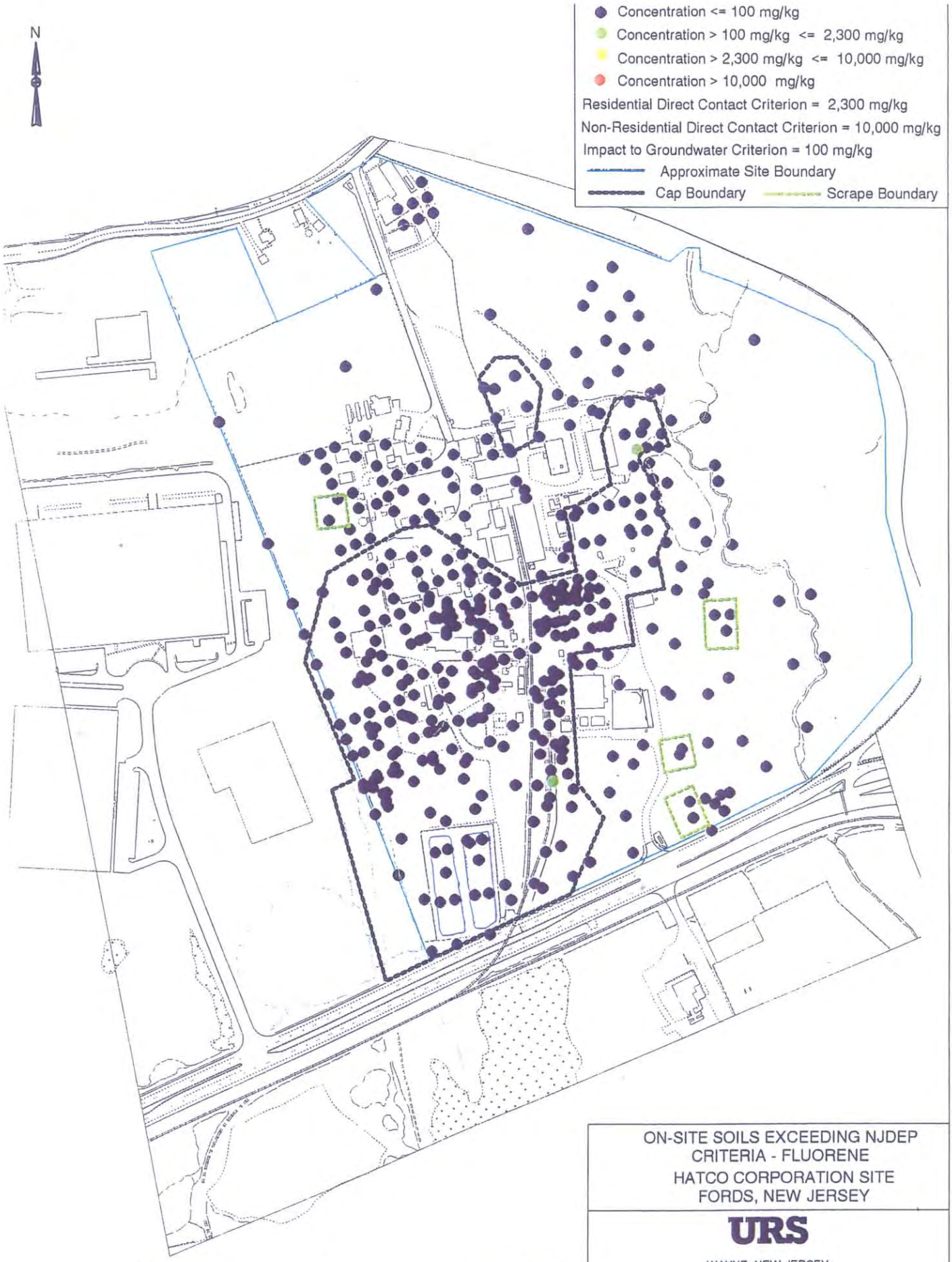

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - FLUORENE

HATCO CORPORATION SITE

FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
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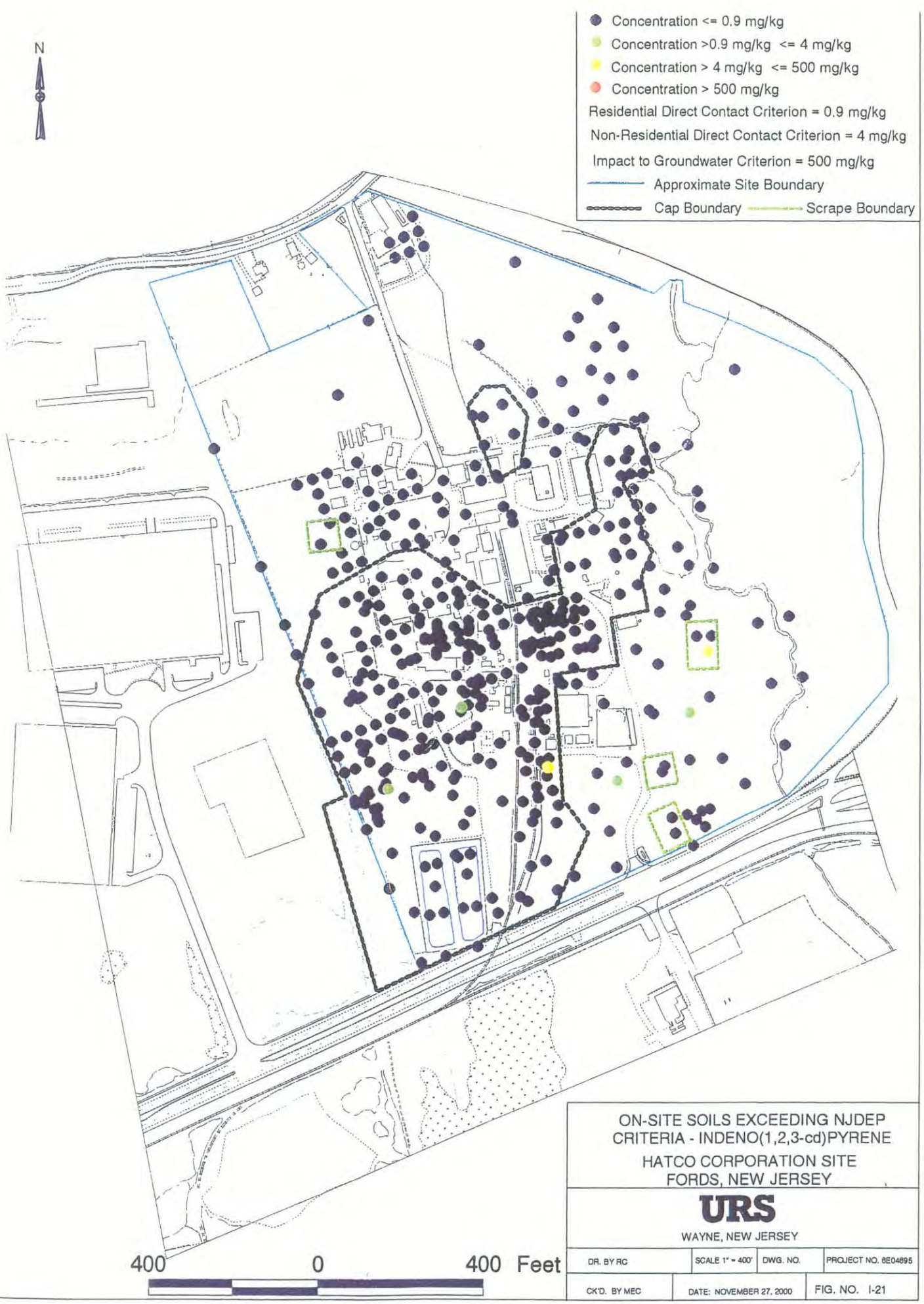


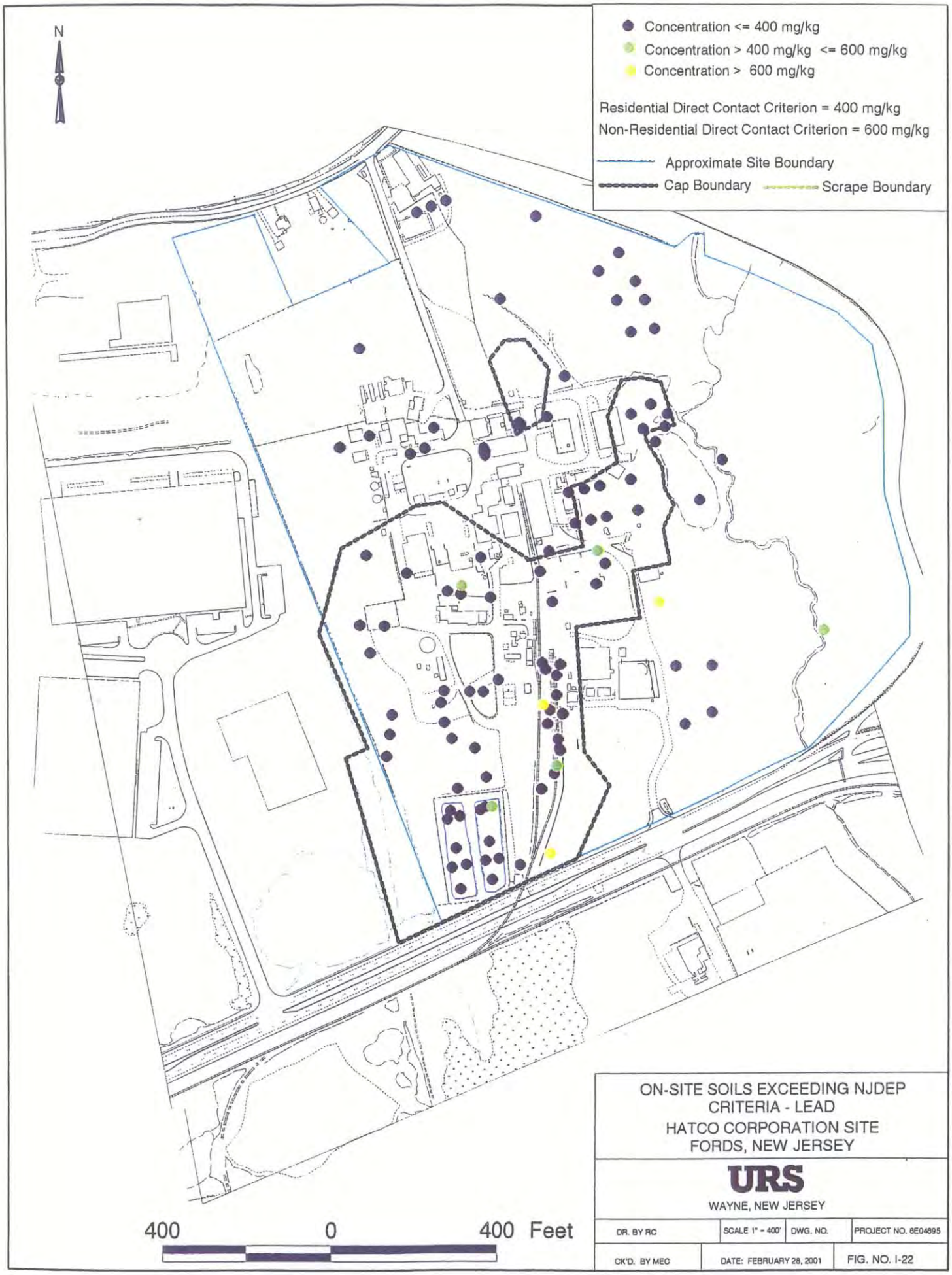
ON-SITE SOILS EXCEEDING NJDEP CRITERIA - INDENO(1,2,3-cd)PYRENE

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

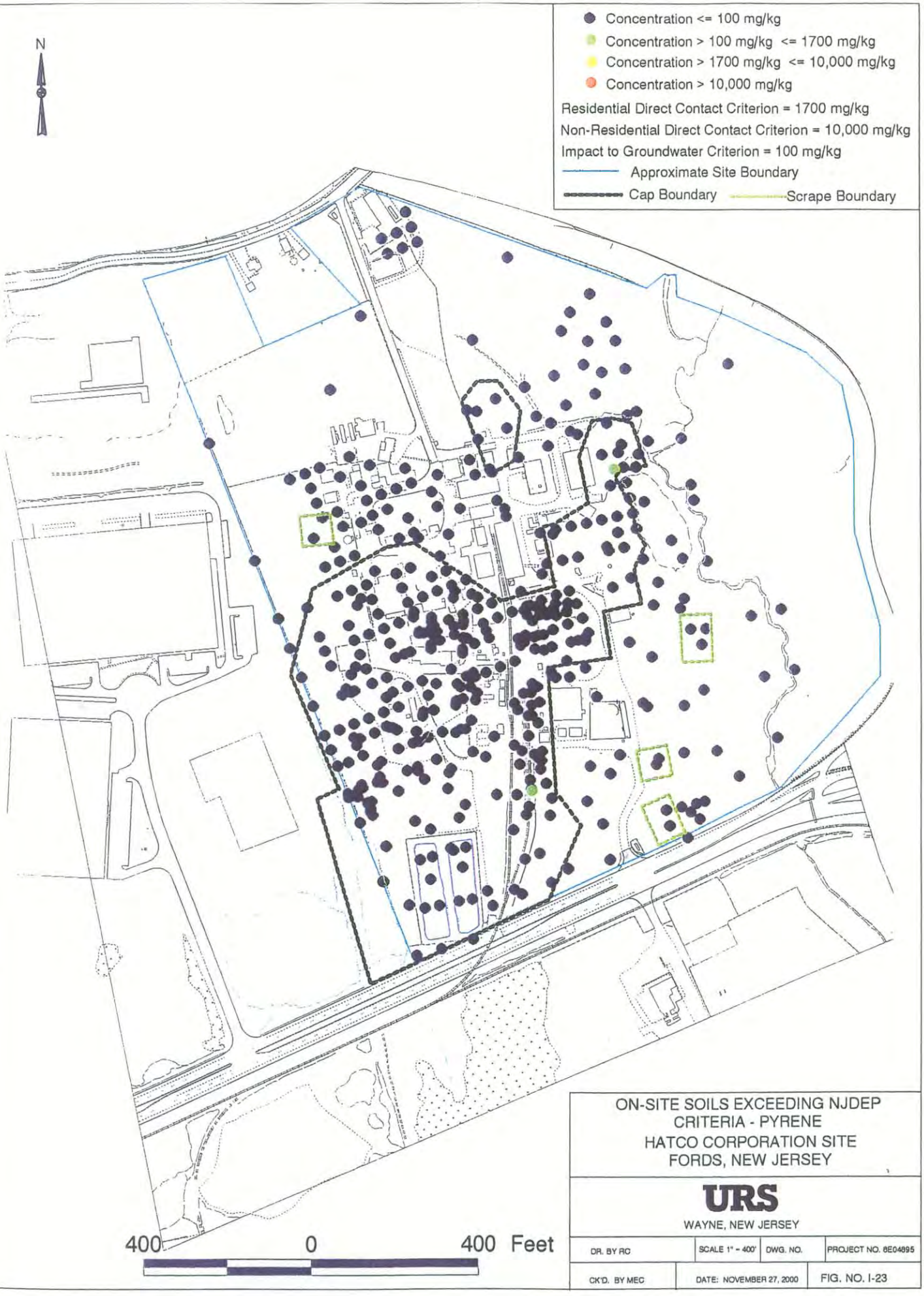
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. I-21	



ON-SITE SOILS EXCEEDING NJDEP CRITERIA - LEAD
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

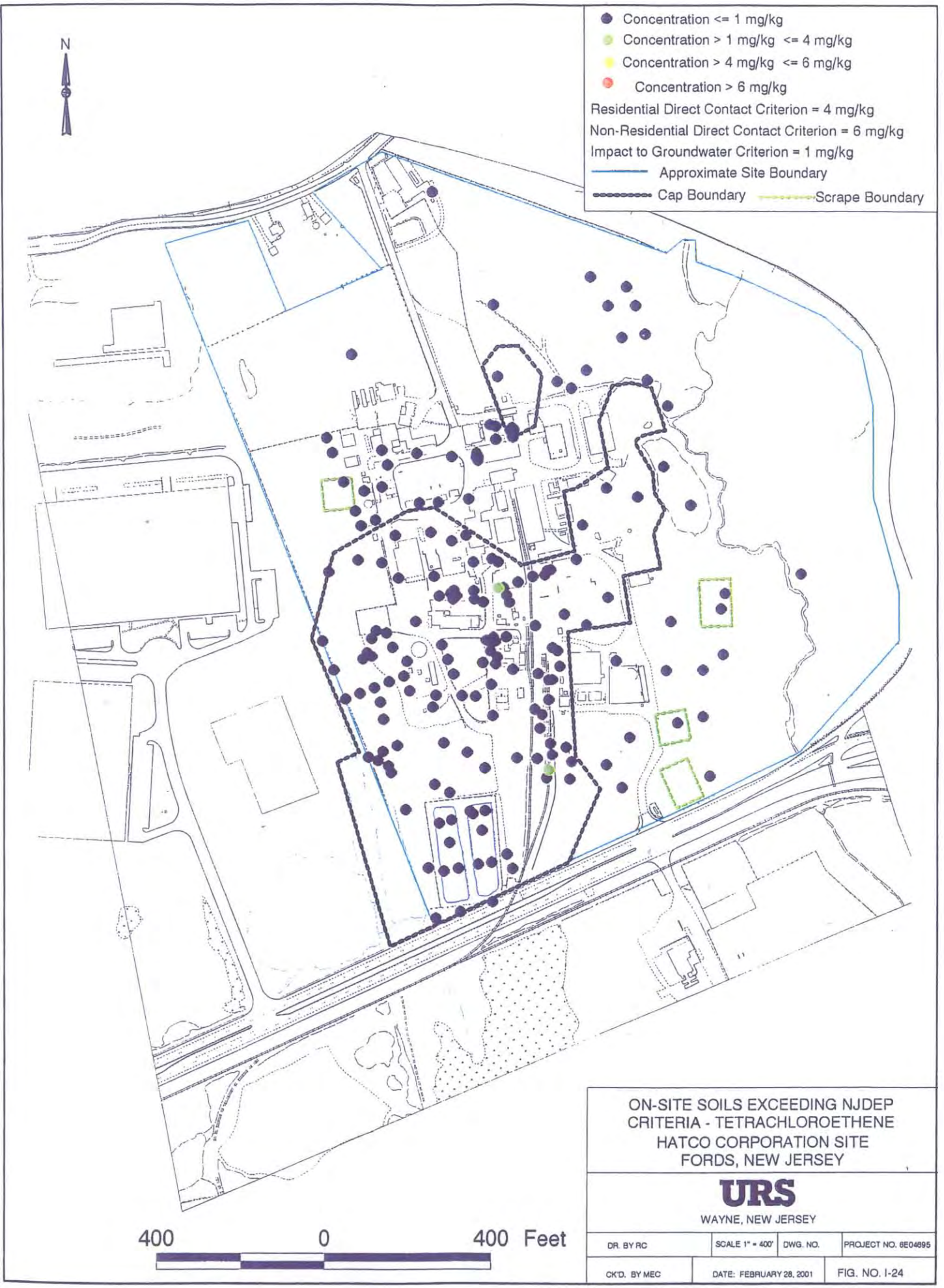
DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 28, 2001		FIG. NO. I-22



ON-SITE SOILS EXCEEDING NJDEP CRITERIA - PYRENE
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. I-23	



ON-SITE SOILS EXCEEDING NJDEP CRITERIA - TETRACHLOROETHENE
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 28, 2001		FIG. NO. 1-24

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - THALLIUM
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

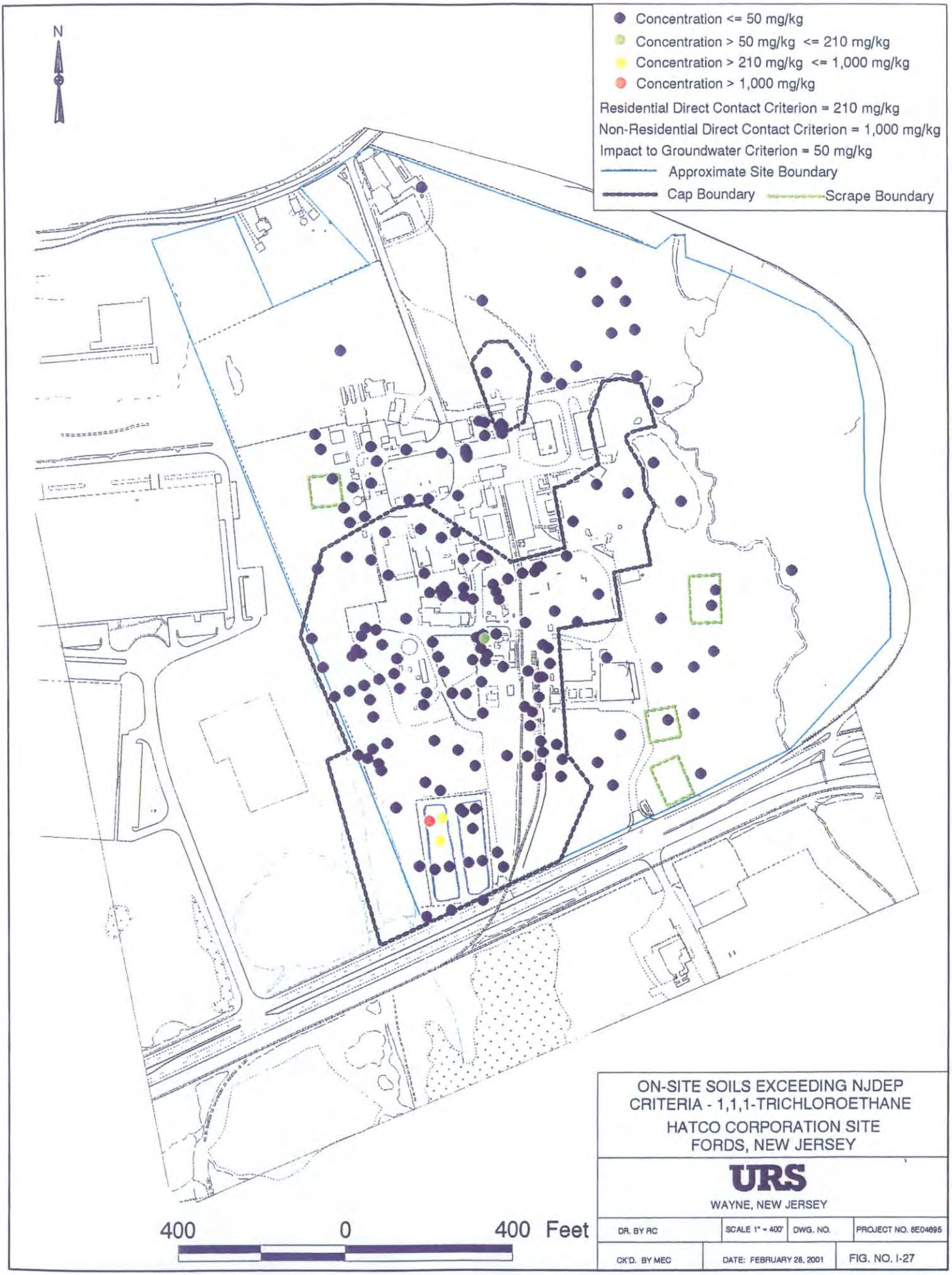
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000		FIG. NO. 1-25

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - TOLUENE
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 8E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. 1-26	



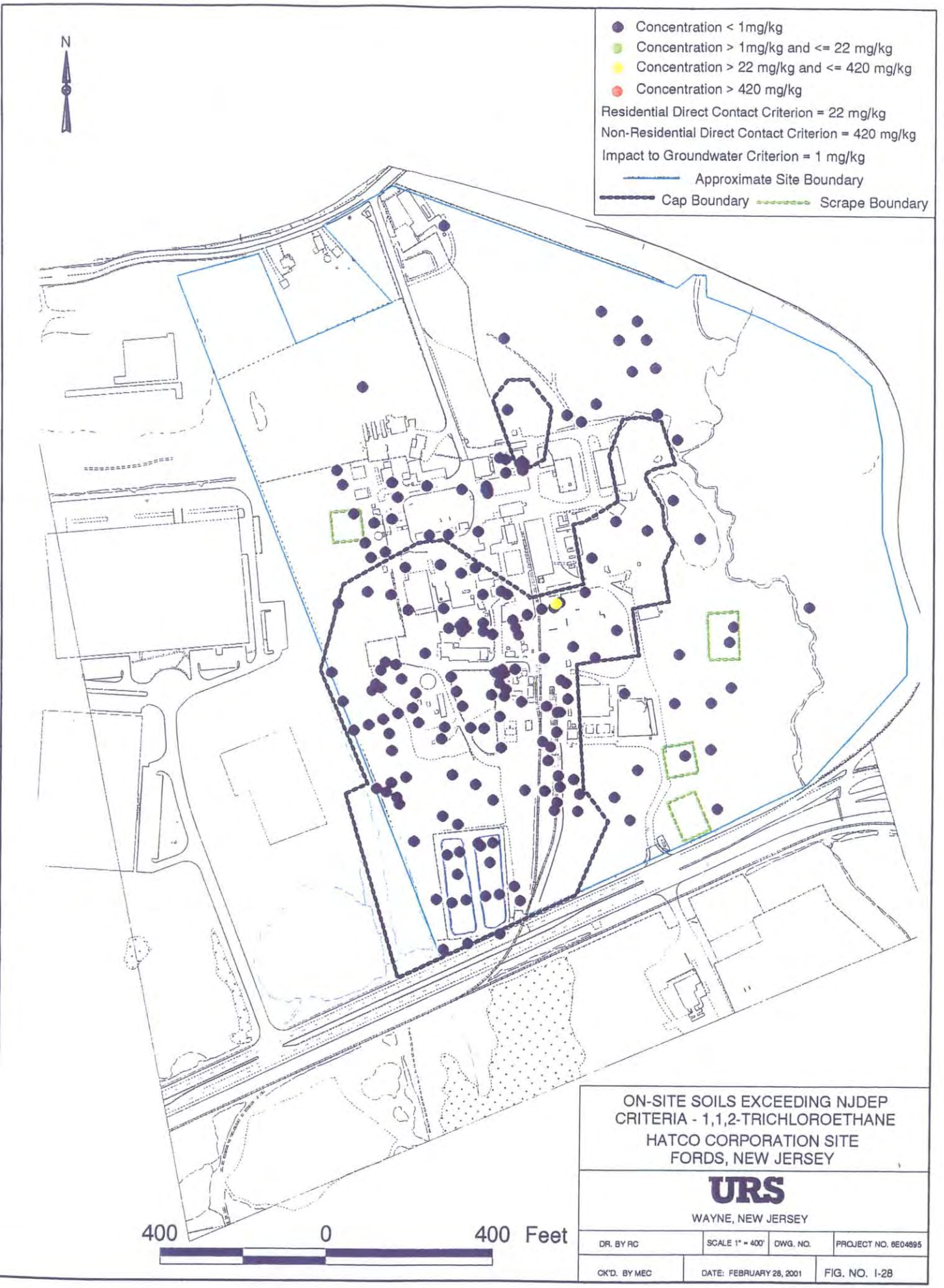
ON-SITE SOILS EXCEEDING NJDEP CRITERIA - 1,1,1-TRICHLOROETHANE

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 28, 2001	FIG. NO. I-27	



ON-SITE SOILS EXCEEDING NJDEP CRITERIA - 1,1,2-TRICHLOROETHANE
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
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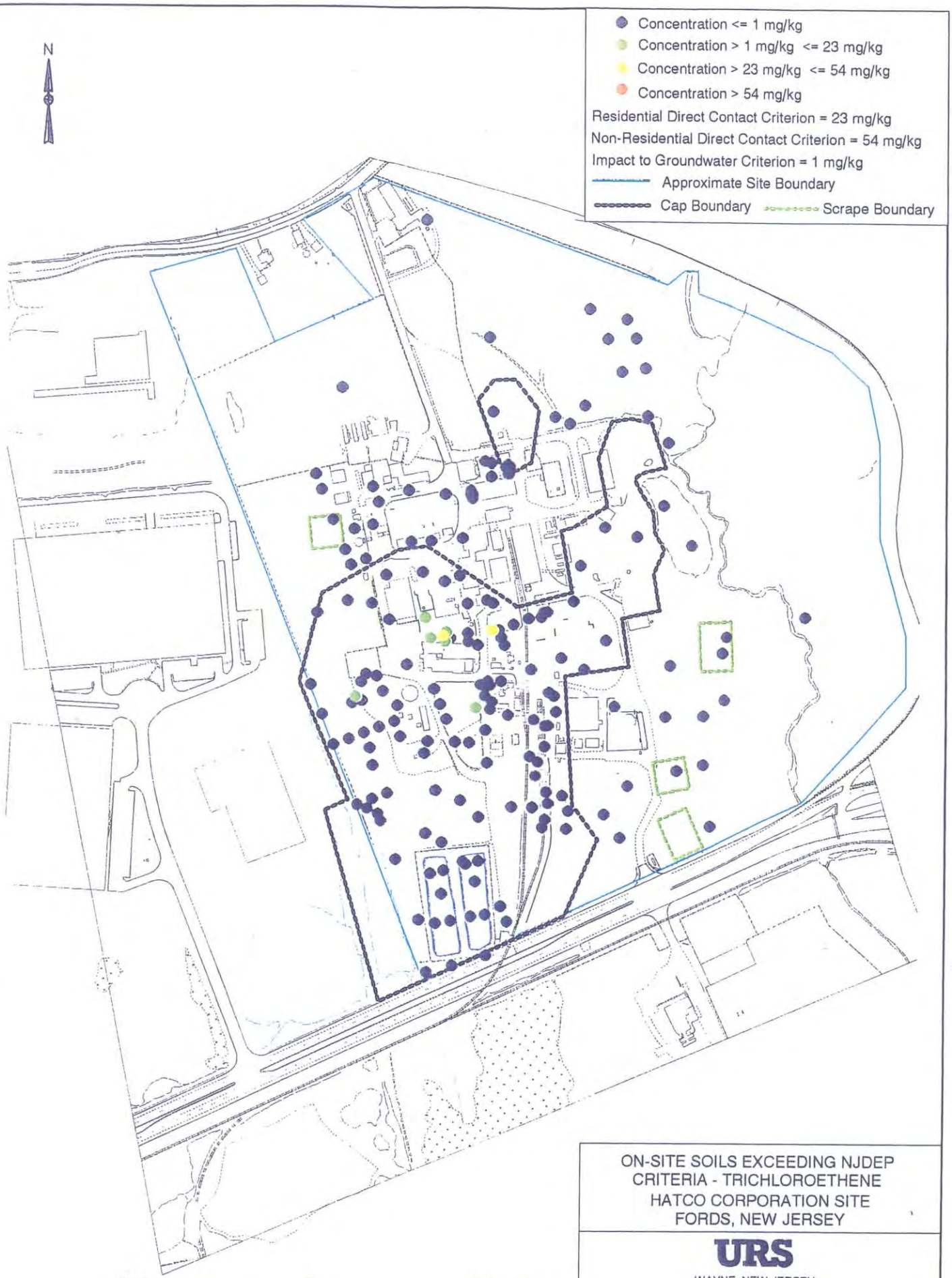
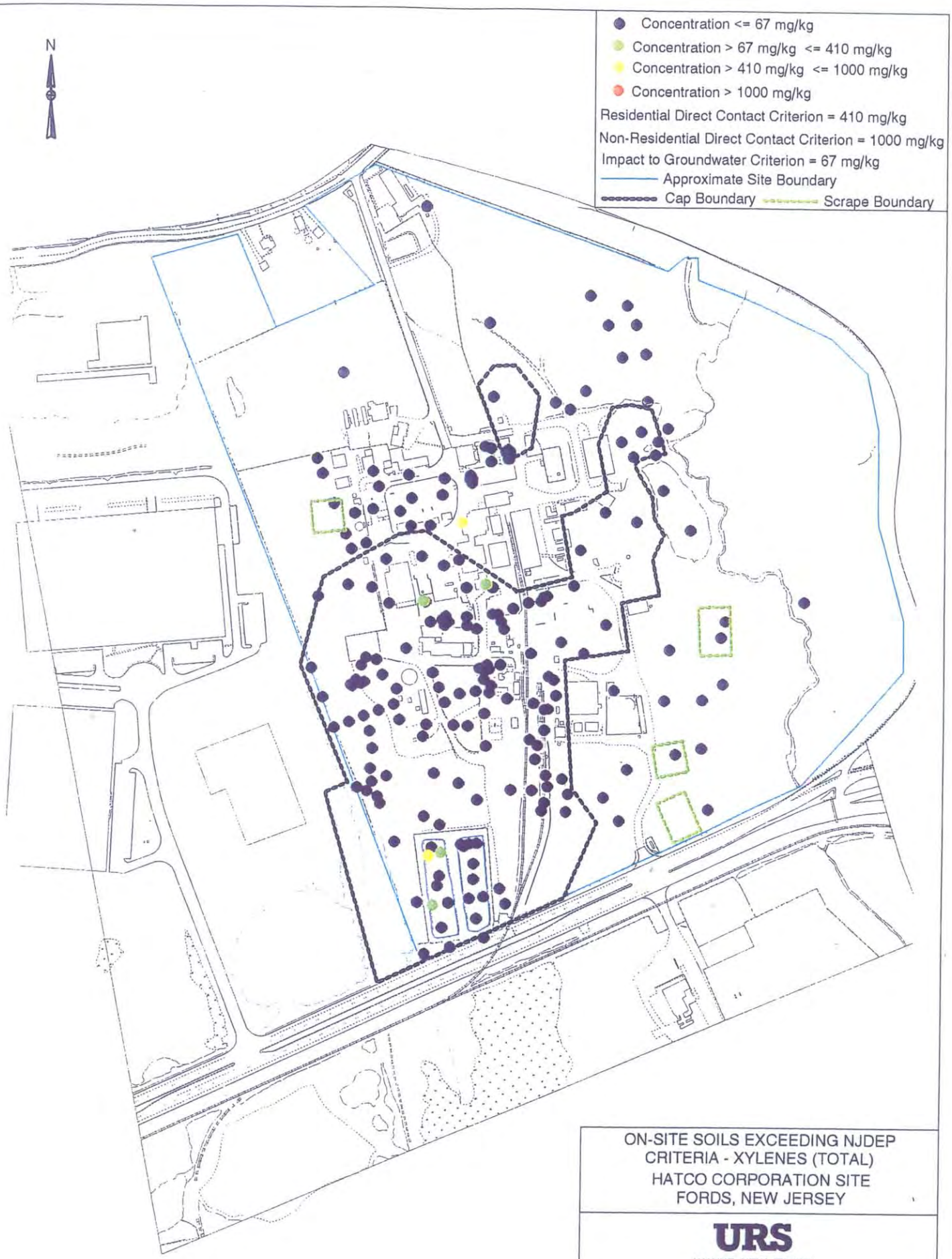


ON-SITE SOILS EXCEEDING NJDEP CRITERIA - TRICHLOROETHENE
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: FEBRUARY 28, 2001	FIG. NO. I-29	



ON-SITE SOILS EXCEEDING NJDEP CRITERIA - XYLENES (TOTAL)
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04895
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. 1-30	

ON-SITE SOILS EXCEEDING NJDEP CRITERIA - ZINC
HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS

WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: NOVEMBER 27, 2000	FIG. NO. I-31	

APPENDIX L
DRAFT DEED NOTICE

IN ACCORDANCE WITH N.J.S.A. 58:10B-13, THIS DOCUMENT IS TO BE RECORDED IN THE SAME MANNER AS ARE DEEDS AND OTHER INTERESTS IN REAL PROPERTY.

Prepared by: _____
[Signature]

_____
[Print name below signature]

Recorded by:

_____
[Signature, Officer of County Recording Office]

_____
[Print name below signature]

DEED NOTICE

This Deed Notice is made as of the _____ day of _____, 20__, by Hatco Corporation, King George Post Road, Fords, New Jersey (together with his/her/its/their successors and assigns, collectively "Owner").

1. THE PROPERTY. Hatco Corporation, King George Post Road, Fords, New Jersey is the owner in fee simple of certain real property designated as Block(s) 60 and 67, Lot(s) 100A and 1B1, on the tax map of the Town of Fords, Middlesex County; the New Jersey Department of Environmental Protection Program Interest Number (Preferred ID) for the contaminated site which includes this property is G000003943; and the property is more particularly described in Exhibit A, which is attached hereto and made a part hereof (the "Property").

2. DEPARTMENT'S ASSIGNED BUREAU. The Bureau of Federal Case Management was the New Jersey Department of Environmental Protection program that was responsible for the oversight of the remediation of the Property. The matter was Case No. G000003943.

3. SOIL CONTAMINATION. Weston Solutions, Inc. has remediated contaminated soil at the Property, and the New Jersey Department of Environmental Protection approved a remedial action on _____, such that soil contamination remains in certain areas of the Property which contains contaminants in concentrations that do not allow for the unrestricted use of the Property; this soil contamination is described, including the type, concentration and specific location of such contaminants, in Exhibit B, which is attached hereto and made a part hereof. As a result, there is a statutory requirement for this Deed Notice and engineering controls in accordance with N.J.S.A. 58:10B-13.

4. CONSIDERATION. In accordance with the New Jersey Department of Environmental Protection's approval of the remedial action work plan for the remediation of the site which included the Property, and in consideration of the terms and conditions of that approval, and other good and valuable consideration, Owner has agreed to subject the Property to certain statutory and regulatory requirements which impose restrictions upon the use of the Property, to restrict certain uses of the Property, and to provide notice to subsequent owners, lessees and operators of the restrictions and the monitoring, maintenance, and biennial certification requirements outlined in this Deed Notice and required by law, as set forth herein.

5A. RESTRICTED AREAS. Due to the presence of these contaminants, the Owner has agreed, as part of the remedial action for the Property, to restrict the use of certain parts of the Property (the "Restricted Areas"); a narrative description of these restrictions, along with the associated monitoring and maintenance activities and the biennial certification requirements are provided in Exhibit C, which is attached hereto and made a part hereof. The Owner has also agreed to maintain a list of these restrictions on site for inspection by governmental enforcement officials.

5B. ENGINEERING CONTROLS. Due to the presence and concentration of these contaminants, the Owner has also agreed, as part of the remedial action for the Property, to the placement of certain engineering controls on the Property; a narrative description of these engineering controls, along with the associated monitoring and maintenance activities and the biennial certification requirements are provided in Exhibit C.]

6A. ALTERATIONS, IMPROVEMENTS, AND DISTURBANCES.

i. Except as provided in Paragraph 6B, below, no person shall make, or allow to be made, any alteration, improvement, or disturbance in, to, or about the Property which disturbs any engineering control at the Property without first obtaining the express written consent of the Department of Environmental Protection. Nothing herein shall constitute a waiver of the obligation of any person to comply with all applicable laws and regulations including, without limitation, the applicable rules of the Occupational Safety and Health Administration. To request the consent of the Department of Environmental Protection, contact:

Department of Environmental Protection
Division of Remediation Management and Response
Bureau of Operation, Maintenance, and Monitoring
Deed Notice Inspection Program
P.O. Box 413
401 E. State Street
Trenton, NJ 08625-0413

ii. Notwithstanding subparagraph 6A.i., above, the Department of Environmental Protection's express written consent is not required for any alteration, improvement, or disturbance provided that the owner, lessee or operator:

(A) Notifies the Department of Environmental Protection of the activity by calling the DEP Hotline, at 1-877-WARN-DEP or 1-877-927-6337, within twenty-four (24) hours after the beginning of each alteration, improvement, or disturbance;

(B) Restores any disturbance of an engineering control to pre-disturbance conditions within sixty (60) calendar days after the initiation of the alteration, improvement or disturbance;

(C) Ensures that all applicable worker health and safety laws and regulations are followed during the alteration, improvement, or disturbance, and during the restoration;

(D) Ensures that exposure to contamination in excess of the applicable remediation standards does not occur;

(E) Submits a written report, describing the alteration, improvement, or disturbance, to the Department of Environmental Protection within sixty (60) calendar days after the end of each alteration, improvement, or disturbance. The owner, lessee or operator shall include in the report the nature of the alteration, improvement, or disturbance, the dates and duration of the alteration, improvement, or disturbance, the name of key individuals and their affiliations conducting the alteration, improvement, or disturbance, a description of the notice the Owner gave to those persons prior to the disturbance, the amounts of soil generated for disposal, if any, the final disposition and any precautions taken to prevent exposure. The owner, lessee, or operator shall submit the report to:

Department of Environmental Protection
Division of Remediation Management and Response
Bureau of Operation, Maintenance, and Monitoring
Deed Notice Inspection Program
P.O. Box 413
401 E. State Street
Trenton, NJ 08625-0413

6B. EMERGENCIES. In the event of an emergency which presents, or may present, an unacceptable risk to the public health and safety, or to the environment, any person may temporarily breach any engineering control provided that that person complies with each of the following:

i. Immediately notifies the Department of Environmental Protection of the emergency, by calling the DEP Hotline at 1-877-WARNDEP or 1-877-927-6337;

ii. Limits both the actual disturbance and the time needed for the disturbance to the minimum reasonably necessary to adequately respond to the emergency;

iii. Implements all measures necessary to limit actual or potential, present or future risk of exposure to humans or the environment to the contamination;

iv. Notifies the Department of Environmental Protection when the emergency has ended by calling the DEP Hotline at 1-877-WARNDEP or 1-877-927-6337;

v. Restores the engineering control to the pre-emergency conditions as soon as possible, and provides a written report to the Department of Environmental Protection of such emergency and restoration efforts within sixty (60) calendar days after completion of the restoration of the engineering control. The report must include all information pertinent to the emergency, potential discharges of contaminants, and restoration measures that were implemented, which, at a minimum, should specify: (a) the nature and likely cause of the emergency, (b) the potential discharges of or exposures to contaminants, if any, that may have occurred, (c) the measures that have been taken to mitigate the effects of the emergency on human health and the environment, (d) the measures completed or implemented to restore the engineering control, and (e) the changes to the engineering control or site operation and maintenance plan to prevent reoccurrence of such conditions in the future. The owner, lessee, or operator shall submit the report to:

Department of Environmental Protection
Division of Remediation Management and Response
Bureau of Operation, Maintenance, and Monitoring
Deed Notice Inspection Program
P.O. Box 413
401 E. State Street
Trenton, NJ 08625-0413]

7A. MONITORING AND MAINTENANCE OF DEED NOTICE, AND PROTECTIVENESS CERTIFICATION. The persons in any way responsible, pursuant to the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11a et seq., for the hazardous substances that remain at the Property, the persons responsible for conducting the remediation, the Owner, and the subsequent owners, lessees, and operators, shall monitor and maintain this Deed Notice, and certify to the Department on a biennial basis that the remedial action that includes this Deed Notice remains protective of the public health and safety and of the environment. The subsequent owners, lessees and operators have this obligation only during their ownership, tenancy, or operation. The specific obligations to monitor and maintain the deed notice shall include all of the following:

i. Monitoring and maintaining this Deed Notice according to the requirements in Exhibit C, to ensure that the remedial action that includes the Deed Notice continues to be protective of the public health and safety and of the environment;

ii. Conducting any additional remedial investigations and implement any additional remedial actions, that are necessary to correct, mitigate, or abate each problem related to the protectiveness of the remedial action for the site prior to the date that the certification is due to the Department pursuant to iii, below, in order to ensure that the remedial action that includes this Deed Notice remains protective of the public health and safety and of the environment.

iii. Certify to the Department of Environmental Protection as to the continued protectiveness of the remedial action that includes this Deed Notice, on a form provided by the Department and consistent with N.J.A.C. 7:26C-1.2 (a)1, every two years on the anniversary of the date the Department issued the no further action letter for the first soil remedial action that included a Deed Notice.

7B. MONITORING AND MAINTENANCE OF ENGINEERING CONTROLS, AND PROTECTIVENESS CERTIFICATION. The persons in any way responsible, pursuant to the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11a et seq., for the hazardous substances that remain at the Property, the person responsible for conducting the remediation, and, the Owner, and the subsequent owners, lessees, and operators, shall maintain all engineering controls at the Property and certify to the Department on a biennial basis that the remedial action of which each engineering control is a part remains protective of the public health and safety and of the environment. The subsequent owners, lessees and operators have this obligation only during their ownership, tenancy, or operation. The specific obligations to monitor and maintain the engineering controls shall include the following:

i. Monitoring and maintaining each engineering control according to the requirements in Exhibit C, to ensure that the remedial action that includes the engineering control continues to be protective of the public health and safety and of the environment;

ii. Conducting any additional remedial investigations and implement any additional remedial actions, that are necessary to correct, mitigate, or abate each problem related to the protectiveness of the remedial action for the Property prior to the date that the certification is due to the Department pursuant to iii, below, in order to ensure that the remedial action that includes the engineering control remains protective of the public health and safety and of the environment.

iii. Certify to the Department of Environmental Protection as to the continued protectiveness of the remedial action that includes the engineering control, on a form provided by the Department and consistent with N.J.A.C. 7:26C-1.2 (a)1, every two years on the anniversary of the date the Department issued the no further action letter for the first soil remedial action that included a Deed Notice.]

8. ACCESS. The Owner and the subsequent owners, lessees and operators agree to allow the Department, its agents and representatives access to the Property to inspect and evaluate the continued protectiveness of the remedial action that includes this Deed Notice and to conduct additional remediation to ensure the protection of the public health and safety and of the environment if persons responsible for monitoring the protectiveness of the remedial action, as described in Paragraph 7, above, fail to conduct such remediation pursuant to this Deed Notice as required by law. The Owner, and the subsequent owners and lessees, shall also cause all leases, subleases, grants, and other written transfers of an interest in the Restricted Areas to contain a provision expressly requiring that all holders thereof provide such access to the Department.

9. NOTICES.

i. The Owner and the subsequent owners and lessees, shall cause all leases, grants, and other written transfers of an interest in the Restricted Areas to contain a provision expressly requiring all holders thereof to take the Property subject to the restrictions contained herein and to comply with all, and not to violate any of the conditions of this Deed Notice. Nothing contained in this Paragraph shall be construed as limiting any obligation of any person to provide any notice required by any law, regulation, or order of any governmental authority.

ii. Owner and all subsequent owners and lessees shall notify any person intending to conduct invasive work or excavate within the Restricted Areas at the Property, including, without limitation, tenants, employees of tenants, and contractors of the nature and location of contamination in the Restricted Areas, and, of the precautions necessary to minimize potential human exposure to contaminants.

iii. The Owner and the subsequent owners shall provide written notice to the Department of Environmental Protection at least thirty (30) calendar days before the effective date of any conveyance, grant, gift, or other transfer, in whole or in part, of the owner's interest in the Restricted Area.

iv. The Owner and the subsequent owners shall provide written notice to the Department within thirty (30) calendar days following the owner's petition for or filing of any document initiating a rezoning of the Property. The Owner and the subsequent owners shall submit the written notice to:

Department of Environmental Protection
Division of Remediation Management and Response
Bureau of Operation, Maintenance, and Monitoring
Deed Notice Inspection Program
P.O. Box 413
401 E. State Street
Trenton, NJ 08625-0413.

10. ENFORCEMENT OF VIOLATIONS.

i. This Deed Notice itself is not intended to create any interest in real estate in favor of the Department of Environmental Protection, nor to create a lien against the Property, but merely is intended to provide notice of certain conditions and restrictions on the Property and to reflect the regulatory and statutory obligations imposed as a conditional remedial action for this site.

ii. The restrictions provided herein may be enforceable solely by the Department against any person who violates this Deed Notice. To enforce violations of this Deed Notice, the Department may initiate one or more enforcement actions pursuant to N.J.S.A. 58:10-23.11u and require additional remediation and assess damages pursuant to N.J.S.A. 58:10-23.11g.

11. SEVERABILITY. If any court of competent jurisdiction determines that any provision of this Deed Notice requires modification, such provision shall be deemed to have been modified automatically to conform to such requirements. If a court of competent jurisdiction determines

that any provision of this Deed Notice is invalid or unenforceable and the provision is of such a nature that it cannot be modified, the provision shall be deemed deleted from this instrument as though the provision had never been included herein. In either case, the remaining provisions of this Deed Notice shall remain in full force and effect.

12. SUCCESSORS AND ASSIGNS. This Deed Notice shall be binding upon Owner and upon Owner's successors and assigns, and subsequent owners, lessees and operators while each is an owner, lessee, or operator of the Property.

13. MODIFICATION AND TERMINATION.

i. Any person may request in writing, at any time, that the Department modify this Deed Notice where performance of subsequent remedial actions, a change of conditions at the Property, or the adoption of revised remediation standards suggest that modification of the Deed Notice would be appropriate.

ii. Any person may request in writing, at any time, that the Department terminate this Deed Notice because the conditions which triggered the need for this Deed Notice are no longer applicable.

iii. This Deed Notice may be revised or terminated only upon filing of an instrument, executed by the Department, in the office of the [*Insert as appropriate the County Clerk/Register of Deeds and Mortgages*] of [*Insert the name of the County*] County, New Jersey, expressly modifying or terminating this Deed Notice.

14A. EXHIBIT A. Exhibit A includes the following maps of the Property and the vicinity:

i. Exhibit A-1: Vicinity Map - A map that identifies by name the roads, and other important geographical features in the vicinity of the Property (for example, Hagstrom County Maps);

ii. Exhibit A-2: Metes and Bounds Description - A metes and bounds description of the Property, including reference to tax lot and block numbers for the Property;

iii. Exhibit A-3: Property Map - A scaled map of the Property, scaled at one inch to 200 feet or less, and if more than one map is submitted, the maps shall be presented as overlays, keyed to a base map; and the Property Map shall include diagrams of major surface topographical features such as buildings, roads, and parking lots.

14B. EXHIBIT B. Exhibit B includes the following descriptions of the Restricted Areas:

i. Exhibit B-1: Restricted Area Map - A separate map for each restricted area that includes:

(A) As-built diagrams of each engineering control, including caps, fences, slurry walls, ground water monitoring wells, and ground water pumping system;

(B) As-built diagrams of any buildings, roads, parking lots and other structures that function as engineering controls; and

(C) Designation of all soil and sediment sample locations within the restricted areas that exceed any soil or sediment standard that are keyed into one of the tables described in the following paragraph.

ii. Exhibit B-2: Restricted Area Data Table - A separate table for each restricted area that includes:

(A) Sample location designation from Restricted Area map (Exhibit B-1);

(B) Sample elevation based upon mean sea level;

(C) Name and chemical abstract service registry number of each contaminant with a concentration that exceeds the unrestricted use standard;

(D) The restricted and unrestricted use standards for each contaminant in the table; and

(E) The remaining concentration of each contaminant at each sample location at each elevation (or if historic fill, include data from the Department's default concentrations at N.J.A.C. 7:26E-4.6, Table 4-2).

14C. EXHIBIT C. Exhibit C includes narrative descriptions of the institutional controls [*Insert as appropriate:* and engineering controls] as follows:

i. Exhibit C-1: Deed Notice as Institutional Control: Exhibit C-1 includes a narrative description of the restriction and obligations of this Deed Notice that are in addition to those describe above, as follows:

(A) General Description of this Deed Notice:

(1) Description and estimated size of the Restricted Areas as described above;

(2) Description of the restrictions on the Property by operation of this Deed Notice; and

(3) The objective of the restrictions.

(B) Description of the monitoring necessary to determine whether:

(1) Any disturbances of the soil in the Restricted Areas did not result in the unacceptable exposure to the soil contamination;

(2) There have been any land use changes subsequent to the filing of this Deed Notice or the most recent biennial certification, whichever is more recent;

(3) The current land use on the Property is consistent with the restrictions in this Deed Notice;

(4) Any newly promulgated or modified requirements of applicable regulations or laws apply to the site; and

(5) Any new standards, regulations, or laws apply to the site that might necessitate additional sampling in order to evaluate the protectiveness of the remedial action which includes this Deed Notice, and conduct the necessary sampling.

(C) Description of the following items that will be included in the biennial certification:

(1) A monitoring report that describes the specific activities, pursuant to (A) and (B), above, conducted in support of the biennial certification of the protectiveness of the remedial action that includes this Deed Notice;

(2) Land use at the Property is consistent with the restrictions in this Deed Notice; and

(3) The remedial action that includes this Deed Notice continues to be protective of the public health and safety and of the environment.

ii. Exhibit C-2: Capping: Exhibit C-2 includes a narrative description of Capping as follows:

(A) General Description of the engineering control:

(1) Description of the engineering control;

(2) The objective of the engineering control; and

(3) How the engineering control is intended to function.

(B) Description of the operation and maintenance necessary to ensure that:

(1) Periodic inspections of each engineering control are performed in order to determine its integrity, operability, and effectiveness;

(2) Each engineering control continues as designed and intended to protect the public health and safety and the environment;

(3) Each alteration, excavation or disturbance of any engineering control is timely and appropriately addressed to maintain the integrity of the engineering control;

(4) This engineering control is being inspected and maintained and its integrity remains so that the remedial action continues to be protective of the public health and safety and of the environment;

(5) A record of the self-inspection dates, name of the inspector, results of the inspection and condition(s) of this engineering control. Sampling, for example, may be necessary if it is not possible to visually evaluate the integrity/ performance of this engineering control; and

(6) Any new standards, regulations, or laws apply to the site that might necessitate additional sampling in order to evaluate the protectiveness of the remedial action which includes this Deed Notice, and conduct the necessary sampling.

(C) Description of the following items that will be included in the biennial certification:

(1) A monitoring report that describes the specific activities, pursuant to (A) and (B), above, conducted in support of the biennial certification of the protectiveness of the remedial action that includes this Deed Notice;

(2) The engineering controls continue to operate as designed; and

(3) The remedial action that includes the engineering control continues to be protective of the public health and safety and of the environment.

15. SIGNATURES. IN WITNESS WHEREOF, Owner has executed this Deed Notice as of the date first written above.

ATTEST: [Name of corporation]

_____ By_____

_____ _____

[Print name and title] [Signature]

STATE OF [State where document is executed] SS.:
COUNTY OF [County where document is executed]

I certify that on _____, 20__, [Name of person executing document on behalf of Owner] personally came before me, and this person acknowledged under oath, to my satisfaction, that:

(a) this person is the [secretary/assistant secretary] of [Owner], the corporation named in this document;

(b) this person is the attesting witness to the signing of this document by the proper corporate officer who is the [president/vice president] of the corporation;

(c) this document was signed and delivered by the corporation as its voluntary act and was duly authorized;

(d) this person knows the proper seal of the corporation which was affixed to this document; and

(e) this person signed this proof to attest to the truth of these facts.

_____

[Signature]

_____

[Print name and title of attesting witness]

Signed and sworn before me on _____, 20__

_____, Notary Public

_____

[Print name and title]

DRAFT

Appendix M
Soil Reuse Proposal

TABLE OF CONTENTS

FIGURES

TABLES

M.1 INTRODUCTION

This Soil Reuse Proposal has been prepared in connection with the Remedial Action Workplan (RAWP) for the Hatco facility, located in Fords, New Jersey (Site) (see Figure M-1). The RAWP was prepared on behalf of W.R. Grace & Co. – Conn. (Grace), and Hatco Corporation (Hatco). The Site is currently owned and operated by Hatco. Details concerning site location, history and background are provided in Section 2 of the RAWP.

A Remedial Investigation (RI) has been completed at the Site in accordance with the New Jersey Department of Environmental Protection (NJDEP) Technical Requirements for Site Remediation and the requirements of the Administrative Consent Order, dated September 9, 1992, between Hatco and NJDEP. Three phases of investigation have been performed at the Site (see Section 2 of the RAWP). The results of the "Phase I" and "Phase II" investigations have been submitted to NJDEP. The Phase III investigation was completed in accordance with the "Phase II Remedial Investigation Workplan Addendum", as modified by Woodward-Clyde Consultants' letter to NJDEP dated August 6, 1997. The results of the Phase III investigation are discussed in Appendix D of the RAWP. Section 3 of the RAWP presents a summary of the results and conclusions of all three phases of investigation.

Section 4 of the RAWP presents the Remedial Action Selection Report (RASR) and a description of the proposed remedy. The proposed remedial action (RA) described in the RAWP consists of:

1. excavation and removal of PCB-contaminated soils greater than 500 mg/kg, capping of contaminated soils on and immediately adjacent to the Site, in conjunction with institutional controls for contaminated soils (Deed Notices);
2. excavation, stabilization and off-site disposal of all materials above the clay layer, backfilling and capping of former impoundments (lagoons) in the southwest corner of the Site (as outlined in Section 4.1);
3. removal and capping of contaminated stream sediments in Crows Mill Creek southwest of the Site;
4. mitigation of on-site and off-site wetlands impacted by the RA; and
5. installation and operation of a recovery system to remove light non-aqueous phase liquid (LNAPL) on the water table from the "Main Production Area" and "Former Muck Area".

This Soil Reuse Proposal has been prepared to address the excavation of several areas of contaminated soils and sediment and the reuse of these materials to assist in achieving appropriate grade to meet drainage requirements prior to installation of a cap over the former impoundments (lagoons). The areas from which soil and sediment will be excavated are shown on Figure M-2. Additional soils such as Channel D sediments and soils with PCBs less than 500 ppm at the cap perimeter may also be placed in the lagoons. Exact volumes of these materials will be determined as the project proceeds.

This Soil Reuse Proposal has been prepared in accordance with the NJDEP's Technical Requirements for Site Remediation (N.J.A.C. 7:26E effective date February 18, 1997, amended July 2, 1999) (TRSR), and the NJDEP 1998 Revised Guidance Document for the Remediation of

Contaminated Soils, dated January 1998.

M.2 WASTE CLASSIFICATION

The nature and extent of contaminated soils at the Site are well defined as described in the RAWP. Over 1,000 soil samples have been collected and analyzed throughout the Site as part of the various site and remedial investigations. The results from the analysis of samples collected in the areas from which soil and sediment for reuse will be derived are summarized in Tables M-1 through M-5. Sample locations are shown on Figure M-2. Based on the levels of constituents detected in these soils and sediments, and based on generator knowledge, these soils and sediments are not classified as hazardous waste as per N.J.A.C. 7:26G-5.1.

M.3 PROPOSED REUSE

M.3.1 Location

The proposed reuse area is located in Woodbridge Township, Middlesex County, New Jersey, in the town of Fords, Block 67, Lot 100-A.

M.3.2 Soil Volume

Soil and sediment volume estimates for each of the respective areas identified in Figure M-2 are outlined below. Actual volumes will be determined after additional delineation sampling is done to refine the excavation areas. Additional soils such as Channel D sediments and soils with PCBs less than 500 ppm at the cap perimeter may also be placed in the lagoons. Exact volumes of these materials will be determined as the project proceeds.

Area	Volume (cubic yards)
A	750
B	1,100
C	750
D	1,100
Channel D	600
Total	**4,300**

M.3.3 Reuse Area

Two former impoundment areas (lagoons) in the southwest corner of the Site will receive the soil and sediment to be reused (Figure M-2). These former lagoons were constructed above grade with clay liners and were used to receive process wastewater effluent. Groundwater is encountered approximately 2 feet below the surrounding grade, and 3 feet below the current base of the lagoons.

As part of the RA for the Site, the former lagoons will be covered. The soil to be reused will be placed in the former lagoons to assist in achieving appropriate grade to meet drainage requirements and subsequently covered as described in Section M.3.5.2. The total volume of fill required is approximately 8,100 cubic yards, with the balance being clean fill derived from off site.

M.3.4 Reliability and Effectiveness of Reuse

The proposed remedy for the former lagoons (limited excavation and soil cover) is reliable and uses fully demonstrated technologies. The long-term effectiveness of this alternative requires long-term maintenance. With such maintenance, this alternative will be effective in the long term, with minimal residual risk. Performance of this alternative is easily monitored. The long-term maintenance and effectiveness will be evaluated consistent with NJDEP's requirement for a biannual certification.

The proposed remedy for the former lagoons will be effective in preventing contact by human and ecological receptors with soils to be reused.

The proposed soil reuse will not affect the performance, reliability or effectiveness of the lagoon remedy.

M.3.5 Other Applicable Data

M.3.5.1 Permits

The following permits will, or are likely to be required, to implement the proposed soil reuse.

- Soil Erosion and Sediment Control Plan
- Stream Encroachment Permit
- 401 Water Quality Certificate
- Local Site Plan Approval

M.3.5.2 Design

As part of the RA for the Site, the former lagoons will be covered. The soil to be reused will be placed in the former lagoons to assist in achieving appropriate grade to meet drainage requirements and subsequently covered. The total volume of fill required is approximately 17,250 cubic yards, with the balance being clean fill derived from off site.

The soil and sediment being reused and clean fill will be compacted on placement in the former lagoons A soil cap will be placed on all of the materials placed in the former lagoons. A detailed design for the cap will be developed as part of the remedial design for the Site. All remediation designs will be developed by a Professional Engineer licensed in the State of New Jersey.

Sediments will be stabilized or dewatered, as necessary, to improve their structural characteristics prior to placement under the on-site cap. The need for stabilizing sediments will be determined in the

field. If the sediments are too wet and soft to allow for grading and cap placement, addition of granular material (e.g., sand or gravel) or absorbents (e.g., flyash) will be considered to improve the structural properties of the sediments.

Maintenance of the cap will be required in accordance with N.J.A.C. 7:26E-6.4(g) with a biannual certification being submitted to NJDEP. Routine maintenance of the soil cover will be performed to maintain an effective grass/vegetation cover. Periodic mowing will be conducted to prevent growth of trees or shrubs that could penetrate the cover layer. Reseeding will be performed as necessary to prevent bare areas that could allow erosion of the cover.

Annual inspections will be performed to ensure that the cover is in good condition. Appropriate corrective action will be implemented if evidence of erosion or degradation of the cover is observed.

M.3.5.3 Controls

Measures to control soil erosion and dust will be prescribed in a Soil Erosion and Sediment Control Plan to be developed prior to implementation of the RA at the Site.

M.3.5.4 Health and Safety

A site-specific Health and Safety Plan (HASP) for sampling and other interim pre-remediation activities being conducted at the Site has been prepared and is contained in Appendix J of the RAWP.

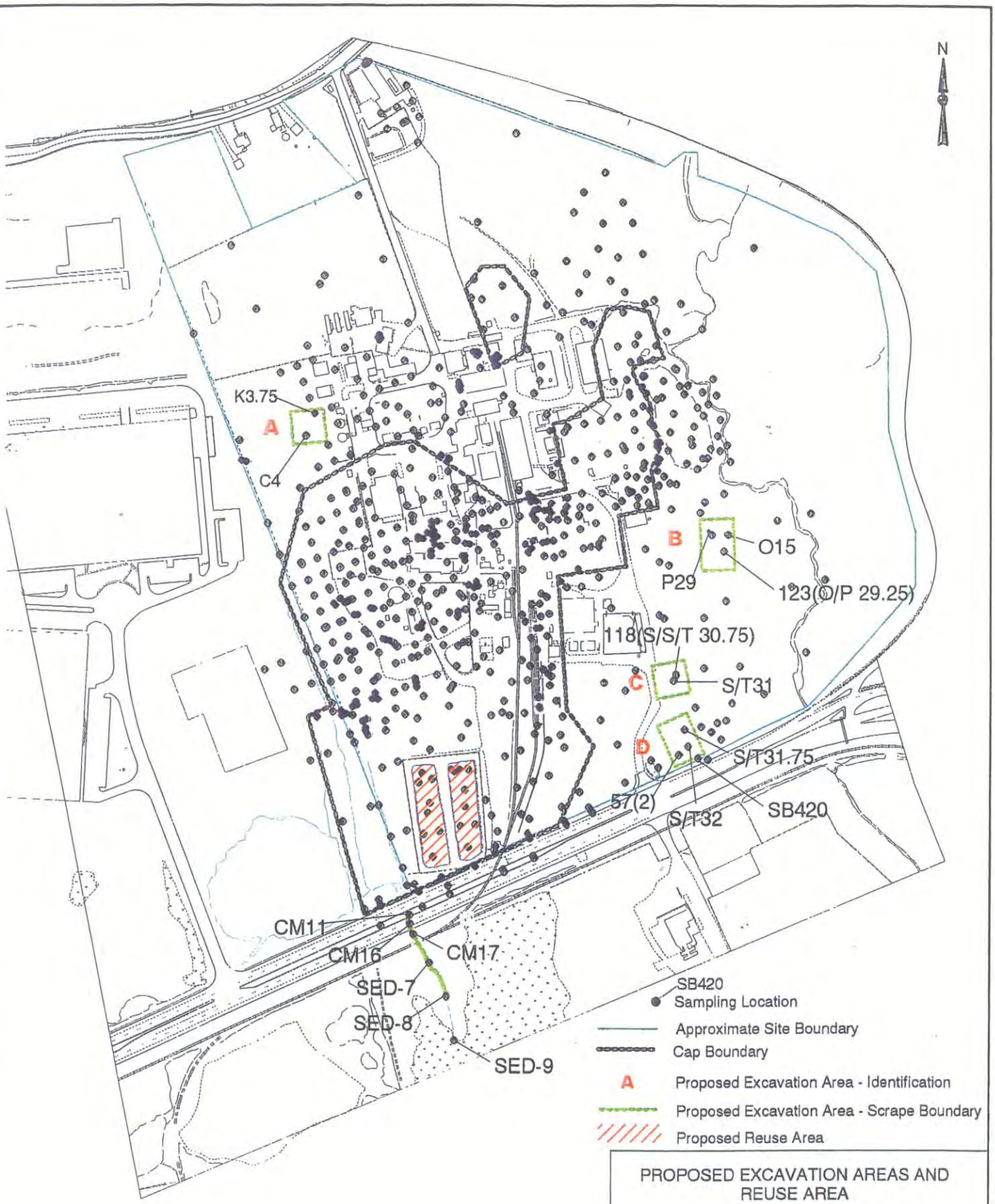
A site-specific HASP to address all remediation activities at the Site will be prepared by the Remediation Contractor retained to implement the RA. The HASP will be prepared in accordance with all applicable federal, state and local requirements including, but not limited to, Occupational Safety and Health Administration Regulations 29 CFR Part 1910 (Occupational Safety and Health Standards) and 29 CFR Part 1926 (Safety and Health Regulations for Construction) and N.J.A.C. 7:26E-1.9. The HASP will outline the health and safety procedures and equipment required for activities to minimize the potential for exposure to site workers, including construction workers. The HASP will be submitted to the NJDEP after retention of the Remediation Contractor and prior to implementation of the RA at the Site.

M.3.5.5 Site Restoration

Areas of the site from which soil and sediment will be removed for reuse will be restored. Soil excavation areas will be restored to original grade by placing compacted clean fill and topsoil. The fill will be seeded and mulched to prevent erosion. Streambeds where sediments are removed for reuse will be backfilled with gravel to restore the drainage channel, and will be allowed to naturally revegetate.

M.3.5.6 Dismantling

No dismantling of structures will be required to implement the reuse plan.



PROPOSED EXCAVATION AREAS AND REUSE AREA

HATCO CORPORATION SITE
FORDS, NEW JERSEY

URS
WAYNE, NEW JERSEY

DR. BY RC	SCALE 1" = 400'	DWG. NO.	PROJECT NO. 6E04695
CK'D. BY MEC	DATE: MARCH 20, 2001		FIG. NO. M-2

Table M-1
Analytical Results for Excavation Area A

SITE	C4		C4		K3.75		K3.75		K3.75		K3.75		K3.75		K3.75	
LOCATOR	C4[0.5]		C4[2.0]		K3.75[0.5]		K3.75[10.0]		K3.75[12.0]		K3.75[4.0]		K3.75[6.0]		K3.75[8.0]	
SAMPLE NUMBER	0 - 0.5 ft		1.5 - 2 ft		0 - 0.5 ft		10 ft		12 ft		4 ft		6 ft		8 ft	
COLLECT DATE	03/11/1988		08/26/1992		09/01/1992		09/01/1992		09/01/1992		09/01/1992		09/01/1992		09/01/1992	
	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organic Compounds																
1,1,1-Trichloroethane	NA		NA		NA		NA		NA		U		NA		NA	
1,1,2,2-Tetrachloroethane	NA		NA		NA		NA		NA		U		NA		NA	
1,1,2-Trichloroethane	NA		NA		NA		NA		NA		U		NA		NA	
1,1-Dichloroethane	NA		NA		NA		NA		NA		U		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA		NA		U		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA		NA		U		NA		NA	
1,2-Dichloroethene (Total)	NA		NA		NA		NA		NA		U		NA		NA	
1,2-Dichloropropane	NA		NA		NA		NA		NA		U		NA		NA	
1,3-Dichlorobenzene	NA		NA		NA		NA		NA		U		NA		NA	
2-Butanone	NA		NA		NA		NA		NA		U		NA		NA	
2-Hexanone	NA		NA		NA		NA		NA		U		NA		NA	
4-Methyl-2-pentanone	NA		NA		NA		NA		NA		U		NA		NA	
Acetone	NA		NA		NA		NA		NA		U		NA		NA	
Benzene	NA		NA		NA		NA		NA		U		NA		NA	
Bromodichloromethane	NA		NA		NA		NA		NA		U		NA		NA	
Bromoform	NA		NA		NA		NA		NA		U		NA		NA	
Bromomethane	NA		NA		NA		NA		NA		U		NA		NA	
Carbon Disulfide	NA		NA		NA		NA		NA		U		NA		NA	
Carbon Tetrachloride	NA		NA		NA		NA		NA		U		NA		NA	
Chlorobenzene	NA		NA		NA		NA		NA		U		NA		NA	
Chloroethane	NA		NA		NA		NA		NA		U		NA		NA	
Chloroform	NA		NA		NA		NA		NA		U		NA		NA	
Chloromethane	NA		NA		NA		NA		NA		U		NA		NA	
cis-1,3-Dichloropropene	NA		NA		NA		NA		NA		U		NA		NA	
Dibromochloromethane	NA		NA		NA		NA		NA		U		NA		NA	
Dichloromethane	NA		NA		NA		NA		NA		U		NA		NA	
Ethylbenzene	NA		NA		NA		NA		NA		U		NA		NA	
Styrene	NA		NA		NA		NA		NA		U		NA		NA	
Tetrachloroethene	NA		NA		NA		NA		NA		U		NA		NA	
Toluene	NA		NA		NA		NA		NA		0.034	U	NA		NA	
trans-1,3-Dichloropropene	NA		NA		NA		NA		NA		U		NA		NA	
Trichloroethene	NA		NA		NA		NA		NA		U		NA		NA	
Trichlorofluoromethane	NA		NA		NA		NA		NA		U		NA		NA	
Vinyl Chloride	NA		NA		NA		NA		NA		U		NA		NA	
Xylenes (Total)	NA		NA		NA		NA		NA		U		NA		NA	
Base/Neutral Compounds																
1,2,4-Trichlorobenzene	NA		U		U		NA		U		U		NA		U	
1,2-Dichlorobenzene	NA		U		U		NA		U		U		NA		U	
1,3-Dichlorobenzene	NA		U		U		NA		U		U		NA		U	
1,4-Dichlorobenzene	NA		U		U		NA		U		U		NA		U	
2,2'-Oxybis(1-Chloropropane)	NA		U		U		NA		U		U		NA		U	
2,4-Dinitrotoluene	NA		U		U		NA		U		U		NA		U	
2,6-Dinitrotoluene	NA		U		U		NA		U		U		NA		U	
2-Chloronaphthalene	NA		U		U		NA		U		U		NA		U	
2-Methylnaphthalene	NA		U		U		NA		U		U		NA		U	
2-Nitroaniline	NA		U		U		NA		U		U		NA		U	
3,3'-Dichlorobenzidine	NA		U		U		NA		U		U		NA		U	
3-Nitroaniline	NA		U		U		NA		U		U		NA		U	
4-Bromophenyl-phenylether	NA		U		U		NA		U		U		NA		U	
4-Chloroaniline	NA		U		U		NA		U		U		NA		U	
4-Chlorophenyl-phenylether	NA		U		U		NA		U		U		NA		U	
4-Nitroaniline	NA		U		U		NA		U		U		NA		U	
Acenaphthene	NA		U		U		NA		U		U		NA		U	
Acenaphthylene	NA		U		U		NA		U		U		NA		U	
Anthracene	NA		U		U		NA		U		U		NA		U	
Benzo[a]anthracene	NA		U		0.6	U	NA		U		0.043	J	NA		0.043	J
Benzo[a]pyrene	NA		U		U		NA		U		U		NA		U	
Benzo[b]fluoranthene	NA		U		U		NA		U		0.035	J	NA		0.029	J
Benzo[g,h,i]perylene	NA		U		U		NA		U		U		NA		U	
Benzo[k]fluoranthene	NA		U		U		NA		U		0.023	J	NA		0.021	J
bis(2-Chloroethoxy)methane	NA		U		U		NA		U		U		NA		U	
bis(2-Chloroethyl)ether	NA		U		U		NA		U		U		NA		U	
bis(2-Ethylhexyl)phthalate	NA		6.8	BA	530	BE	NA		4.1	B	8.6	BE	NA		9.6	BE
butylbenzylphthalate	NA		U		24	U	NA		0.059	J	0.67	U	NA		0.48	J
Carbazole	NA		U		U		NA		U		0.026	J	NA		0.023	J
Chrysene	NA		U		U		NA		U		0.048	J	NA		0.043	J
Dibenz[a,h]anthracene	NA		U		U		NA		U		U		NA		U	
Dibenzofuran	NA		U		U		NA		U		U		NA		U	
diethylphthalate	NA		U		U		NA		U		0.016	J	NA		U	

Table M-1
Analytical Results for Excavation Area A

SITE	C4		C4		K3.75		K3.75		K3.75		K3.75		K3.75		K3.75	
LOCATOR	C4[0.5]		C4[2.0]		K3.75[0.5]		K3.75[10.0		K3.75[12.0]		K3.75[4.0]		K3.75[6.0]		K3.75[8.0]	
SAMPLE NUMBER	0 - 0.5 ft		1.5 - 2 ft		0 - 0.5 ft		10 ft		12 ft		4 ft		6 ft		8 ft	
COLLECT DATE	03/11/1988		08/26/1992		09/01/1992		09/01/1992		09/01/1992		09/01/1992		09/01/1992		09/01/1992	
	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Dimethylphthalate	NA			U		U	NA			U		U	NA			U
Di-n-butylphthalate	NA			U		U	NA			U	0.103	JB	NA		0.045	JB
Di-n-octylphthalate	NA		0.27	J	68	U	NA		0.23	J	1.8	U	NA		1.5	U
Fluoranthene	NA			U	1.1	J	NA			U	0.088	J	NA		0.08	J
Fluorene	NA			U		U	NA			U	0.02	J	NA			U
Hexachlorobenzene	NA			U		U	NA			U		U	NA			U
Hexachlorobutadiene	NA			U		U	NA			U		U	NA			U
Hexachlorocyclopentadiene	NA			U		U	NA			U		U	NA			U
Hexachloroethane	NA			U		U	NA			U		U	NA			U
Indeno[1,2,3-cd]pyrene	NA			U		U	NA			U		U	NA			U
Isophorone	NA			U		U	NA			U		U	NA			U
Naphthalene	NA			U		U	NA			U	0.028	J	NA			U
Nitrobenzene	NA			U		U	NA			U		U	NA			U
N-Nitroso-di-n-propylamine	NA			U		U	NA			U		U	NA			U
N-Nitrosodiphenylamine	NA			U		U	NA			U		U	NA			U
Phenanthrene	NA			U	1	J	NA			U	0.073	J	NA		0.069	J
Pyrene	NA			U	0.9	J	NA			U	0.071	J	NA		0.065	J
PCBs																
Aroclor-1016		U		U		U		U		U		U		U		U
Aroclor-1221		U		U		U		U		U		U		U		U
Aroclor-1232		U		U		U		U		U		U		U		U
Aroclor-1242		U		U		U		U		U		U		U		U
Aroclor-1248	0.16		0.12	P	0.89	J		U		U		U		U		U
Aroclor-1254		U	0.092	X		U		U		U		U		U		U
Aroclor-1260		U		U		U		U		U		U		U		U

Notes:
all results in mg/kg
Q = Data qualifier
B = Analyte detected in method blank.
E = Concentration exceeds calibration range.
P = Pesticide/PCB Qualifier - the detected concentration between two GC columns is greater than 25%.
J = Concentration is an estimated value
A = Undefined
D = Concentration was reported from the diluted sample
U = Compound was not detected
X = Undefined
NA = Not analyzed

Table M-2
Analytical Results for Excavation Area B

SITE	123(O/P 29.25)		123(O/P 29.25)		O15		O15		O15		P29	
LOCATOR	123(O/P 29.25)[0.5]		123(O/P 29.25)[2.0]		O15[0.5]		O15[2.5]		O15[3.0]		P29[2.0]	
SAMPLE NUMBER	0 - 0.5 ft		1.5 - 2 ft		0 - 0.5 ft		2 - 2.5 ft		2.5 - 3 ft		1.5 - 2 ft	
COLLECT DATE	12/16/1987		12/16/1987		03/25/1988		03/25/1988		03/25/1988		09/02/1992	
	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organic Compounds												
1,1,1-Trichloroethane	NA		U		NA		U		NA		NA	
1,1,2,2-Tetrachloroethane	NA		U		NA		U		NA		NA	
1,1,2-Trichloroethane	NA		U		NA		U		NA		NA	
1,1-Dichloroethane	NA		U		NA		U		NA		NA	
1,1-Dichloroethene	NA		U		NA		U		NA		NA	
1,2-Dichloroethane	NA		U		NA		U		NA		NA	
1,2-Dichloroethene (Total)	NA		U		NA		U		NA		NA	
1,2-Dichloropropane	NA		U		NA		U		NA		NA	
1,3-Dichlorobenzene	NA		U		NA		U		NA		NA	
2-Butanone	NA		U		NA		U		NA		NA	
2-Hexanone	NA		U		NA		U		NA		NA	
4-Methyl-2-pentanone	NA		U		NA		U		NA		NA	
Acetone	NA		U		NA		U		NA		NA	
Benzene	NA		U		NA		0.004	JB	NA		NA	
Bromodichloromethane	NA		U		NA		U		NA		NA	
Bromoform	NA		U		NA		U		NA		NA	
Bromomethane	NA		U		NA		U		NA		NA	
Carbon Disulfide	NA		U		NA		U		NA		NA	
Carbon Tetrachloride	NA		U		NA		U		NA		NA	
Chlorobenzene	NA		U		NA		U		NA		NA	
Chloroethane	NA		U		NA		U		NA		NA	
Chloroform	NA		U		NA		U		NA		NA	
Chloromethane	NA		U		NA		U		NA		NA	
cis-1,3-Dichloropropene	NA		U		NA		U		NA		NA	
Dibromochloromethane	NA		U		NA		U		NA		NA	
Dichloromethane	NA		U		NA		0.03		NA		NA	
Ethylbenzene	NA		U		NA		0.004	J	NA		NA	
Styrene	NA		U		NA		U		NA		NA	
Tetrachloroethene	NA		U		NA		U		NA		NA	
Toluene	NA		U		NA		0.02	J	NA		NA	
trans-1,3-Dichloropropene	NA		U		NA		U		NA		NA	
Trichloroethene	NA		U		NA		U		NA		NA	
Trichlorofluoromethane	NA		U		NA		U		NA		NA	
Vinyl Chloride	NA		U		NA		U		NA		NA	
Xylenes (Total)	NA		U		NA		U		NA		NA	
Semi-volatile Compounds												
1,2,4-Trichlorobenzene	U		NA		U		U		U		U	
1,2-Dichlorobenzene	U		NA		U		U		U		U	
1,3-Dichlorobenzene	U		NA		U		U		U		U	
1,4-Dichlorobenzene	U		NA		U		U		U		U	
2,2'-Oxybis(1-Chloropropane)	U		NA		U		U		U		U	
2,4,5-Trichlorophenol	NA		NA		U		U		NA		NA	
2,4,6-Trichlorophenol	NA		NA		U		U		NA		NA	
2,4-Dichlorophenol	NA		NA		U		U		NA		NA	
2,4-Dimethylphenol	NA		NA		U		U		NA		NA	
2,4-Dinitrophenol	NA		NA		U		U		NA		NA	
2,4-Dinitrotoluene	U		NA		U		U		U		U	
2,6-Dinitrotoluene	U		NA		U		U		U		U	
2-Chloronaphthalene	U		NA		U		U		U		U	
2-Chlorophenol	NA		NA		U		U		NA		NA	
2-Methylnaphthalene	U		NA		U		U		U		U	
2-Methylphenol	NA		NA		U		U		NA		NA	
2-Nitroaniline	U		NA		U		U		U		U	
2-Nitrophenol	NA		NA		U		U		NA		NA	
3,3'-Dichlorobenzidine	U		NA		U		U		U		U	
3-Nitroaniline	U		NA		U		U		U		U	
4,6-Dinitro-2-Methylphenol	NA		NA		U		U		NA		NA	
4-Bromophenyl-phenylether	U		NA		U		U		U		U	
4-Chloro-3-Methylphenol	NA		NA		U		U		NA		NA	
4-Chloroaniline	U		NA		U		U		U		U	
4-Chlorophenyl-phenylether	U		NA		U		U		U		U	
4-Methylphenol	NA		NA		U		U		NA		NA	
4-Nitroaniline	U		NA		U		U		U		U	
4-Nitrophenol	NA		NA		U		U		NA		NA	
Acenaphthene	U		NA		U		9.4		63		U	
Acenaphthylene	6.9	J	NA		U		U		U		U	
Anthracene	2.3	J	NA		U		7.5		15		U	

Table M-2
Analytical Results for Excavation Area B

SITE	123(O/P 29.25)		123(O/P 29.25)		O15		O15		O15		P29	
LOCATOR	123(O/P 29.25)[0.5]		123(O/P 29.25)[2.0]		O15[0.5]		O15[2.5]		O15[3.0]		P29[2.0]	
SAMPLE NUMBER	0 - 0.5 ft		1.5 - 2 ft		0 - 0.5 ft		2 - 2.5 ft		2.5 - 3 ft		1.5 - 2 ft	
COLLECT DATE	12/16/1987		12/16/1987		03/25/1988		03/25/1988		03/25/1988		09/02/1992	
	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Benzo[a]anthracene	8.7	J	NA		U		21		U		U	
Benzo[a]pyrene	12		NA		9.6		U		U		U	
Benzo[b]fluoranthene	14		NA		U		U		U		U	
Benzo[g,h,i]perylene	5.6	J	NA		U		U		U		U	
Benzo[k]fluoranthene	U		NA		U		U		U		U	
bis(2-Chloroethoxy)methane	U		NA		U		U		U		U	
bis(2-Chloroethyl)ether	U		NA		U		U		U		U	
bis(2-Ethylhexyl)phthalate	14		NA		U		U		U		0.56	
butylbenzylphthalate	7.9		NA		U		U		U		0.049	J
Carbazole	U		NA		U		U		U		U	
Chrysene	9.2		NA		6.3		25		U		U	
Dibenz[a,h]anthracene	U		NA		U		U		U		U	
Dibenzofuran	U		NA		U		U		U		U	
diethylphthalate	U		NA		U		U		U		U	
Dimethylphthalate	U		NA		U		U		U		U	
Di-n-butylphthalate	U		NA		U		U		U		0.075	J
Di-n-octylphthalate	U		NA		U		U		U		0.011	J
Fluoranthene	9.5		NA		U		14		19		U	
Fluorene	U		NA		U		6.5		23		U	
Hexachlorobenzene	U		NA		U		U		U		U	
Hexachlorobutadiene	U		NA		U		U		U		U	
Hexachlorocyclopentadiene	U		NA		U		U		U		U	
Hexachloroethane	U		NA		U		U		U		U	
Indeno[1,2,3-cd]pyrene	10		NA		U		U		U		U	
Isophorone	U		NA		U		U		U		U	
Naphthalene	2.8	J	NA		8.1		7.3		370		U	
Nitrobenzene	U		NA		U		U		U		U	
N-Nitroso-di-n-propylamine	U		NA		U		U		U		U	
N-Nitrosodiphenylamine	U		NA		U		U		U		U	
Pentachlorophenol	NA		NA		U		U		NA		NA	
Phenanthrene	3.6	J	NA		1.7		37		55		U	
Phenol	NA		NA		U		U		NA		NA	
Pyrene	15		NA		3.4		54		35		U	
Total Petroleum Hydrocarbons												
Petroleum Hydrocarbons	160		NA		750		3600		14		NA	
PCBs												
Aroclor-1016	NA		NA		U		NA		U		U	
Aroclor-1221	NA		NA		U		NA		U		U	
Aroclor-1232	NA		NA		U		NA		U		U	
Aroclor-1242	NA		NA		U		NA		U		U	
Aroclor-1248	NA		NA		U		NA		U		U	
Aroclor-1254	NA		NA		U		NA		U		U	
Aroclor-1260	NA		NA		U		NA		U		U	

Notes:
all results in mg/kg
Q = Data qualifier
J = Concentration is an estimated value
B = Analyte detected in method blank.
D = Concentration was reported from the diluted sample
U = Compound was not detected
NA = Not analyzed

Table M-3
Analytical Results for Excavation Area C

SITE	118(S/S/T 30.75)		118(S/S/T 30.75)		118(S/S/T 30.75)		S/T31		S/T31	
LOCATOR	118(S/S/T 30.75)[0.5]		118(S/S/T 30.75)[2.0]		118(S/S/T 30.75)[6.0]		S/T31[0.5]		S/T31[2.0]	
SAMPLE NUMBER	0 - 0.5 ft		1.5 - 2 ft		5.5 - 6 ft		0 - 0.5 ft		1.5 - 2 ft	
COLLECT DATE	12/17/1987		12/17/1987		12/17/1987		09/01/1992		09/01/1992	
	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organic Compounds										
1,1,1-Trichloroethane	NA		U		U		NA		NA	
1,1,2,2-Tetrachloroethane	NA		U		U		NA		NA	
1,1,2-Trichloroethane	NA		U		U		NA		NA	
1,1-Dichloroethane	NA		U		U		NA		NA	
1,1-Dichloroethene	NA		U		U		NA		NA	
1,2-Dichloroethane	NA		U		U		NA		NA	
1,2-Dichloroethene (Total)	NA		U		U		NA		NA	
1,2-Dichloropropane	NA		U		U		NA		NA	
1,3-Dichlorobenzene	NA		U		U		NA		NA	
2-Butanone	NA		U		U		NA		NA	
2-Hexanone	NA		U		U		NA		NA	
4-Methyl-2-pentanone	NA		U		U		NA		NA	
Acetone	NA		U		U		NA		NA	
Benzene	NA		U		U		NA		NA	
Bromodichloromethane	NA		U		U		NA		NA	
Bromoform	NA		U		U		NA		NA	
Bromomethane	NA		U		U		NA		NA	
Carbon Disulfide	NA		U		U		NA		NA	
Carbon Tetrachloride	NA		U		U		NA		NA	
Chlorobenzene	NA		U		U		NA		NA	
Chloroethane	NA		U		U		NA		NA	
Chloroform	NA		U		U		NA		NA	
Chloromethane	NA		U		U		NA		NA	
cis-1,3-Dichloropropene	NA		U		U		NA		NA	
Dibromochloromethane	NA		U		U		NA		NA	
Dichloromethane	NA		U		U		NA		NA	
Ethylbenzene	NA		U		U		NA		NA	
Styrene	NA		U		U		NA		NA	
Tetrachloroethene	NA		U		U		NA		NA	
Toluene	NA		U		U		NA		NA	
trans-1,3-Dichloropropene	NA		U		U		NA		NA	
Trichloroethene	NA		U		U		NA		NA	
Trichlorofluoromethane	NA		U		U		NA		NA	
Vinyl Chloride	NA		U		U		NA		NA	
Xylenes (Total)			U		U					
Base/Neutral Compounds										
1,2,4-Trichlorobenzene	U		NA		U		U		U	
1,2-Dichlorobenzene	U		NA		U		U		U	
1,3-Dichlorobenzene	U		NA		U		U		U	
1,4-Dichlorobenzene	U		NA		U		U		U	
2,2'-Oxybis(1-Chloropropane)	U		NA		U		U		U	
2,4-Dinitrotoluene	U		NA		U		U		U	
2,6-Dinitrotoluene	U		NA		U		U		U	
2-Chloronaphthalene	U		NA		U		U		U	
2-Chlorophenol			NA		NA		NA		NA	
2-Methylnaphthalene	U		NA		U		U		U	
2-Methylphenol			NA		NA		NA		NA	
2-Nitroaniline	U		NA		U		U		U	
2-Nitrophenol			NA		NA		NA		NA	
3,3'-Dichlorobenzidine	U		NA		U		U		U	
3-Nitroaniline	U		NA		U		U		U	
4,6-Dinitro-2-Methylphenol			NA		NA		NA		NA	
4-Bromophenyl-phenylether	U		NA		U		U		U	
4-Chloro-3-Methylphenol			NA		NA		NA		NA	
4-Chloroaniline	U		NA		U		U		U	
4-Chlorophenyl-phenylether	U		NA		U		U		U	
4-Methylphenol			NA		NA		NA		NA	
4-Nitroaniline	U		NA		U		U		U	
4-Nitrophenol			NA		NA		NA		NA	
Acenaphthene	U		NA		U		U		U	
Acenaphthylene	U		NA		U		U		U	
Anthracene	U		NA		U		U		U	
Benzo[a]anthracene	0.14	J	NA		U		0.093	J	U	
Benzo[a]pyrene	0.23		NA		U		0.107	J	U	
Benzo[b]fluoranthene	0.2		NA		U		0.083	J	U	
Benzo[g,h,i]perylene	0.48		NA		U		U		U	
Benzo[k]fluoranthene	U		NA		U		0.061	J	U	
bis(2-Chloroethoxy)methane	U		NA		U		U		U	
bis(2-Chloroethyl)ether	U		NA		U		U		U	
bis(2-Ethylhexyl)phthalate	1.2		NA		0.43		9.7	B	0.42	B
butylbenzylphthalate	0.12		NA		U		0.14	UJ	U	
Carbazole	U		NA		U		U		U	

Table M-3
Analytical Results for Excavation Area C

SITE	118(S/S/T 30.75)		118(S/S/T 30.75)		118(S/S/T 30.75)		S/T31		S/T31	
LOCATOR	118(S/S/T 30.75)[0.5]		118(S/S/T 30.75)[2.0]		118(S/S/T 30.75)[6.0]		S/T31[0.5]		S/T31[2.0]	
SAMPLE NUMBER	0 - 0.5 ft		1.5 - 2 ft		5.5 - 6 ft		0 - 0.5 ft		1.5 - 2 ft	
COLLECT DATE	12/17/1987		12/17/1987		12/17/1987		09/01/1992		09/01/1992	
	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chrysene	0.18		NA		U		0.13	J	U	
Dibenz[a,h]anthracene	U		NA		U		U		U	
Dibenzofuran	U		NA		U		U		U	
diethylphthalate	U		NA		U		U		U	
Dimethylphthalate	U		NA		U		U		U	
Di-n-butylphthalate	0.06	J	NA		U		0.73	JB	0.026	JB
Di-n-octylphthalate	U		NA		U		U		U	
Fluoranthene	0.09		NA		U		0.12	J	0.01	J
Fluorene	U		NA		U		U		U	
Hexachlorobenzene	U		NA		U		U		U	
Hexachlorobutadiene	U		NA		U		U		U	
Hexachlorocyclopentadiene	U		NA		U		U		U	
Hexachloroethane	U		NA		U		U		U	
Indeno[1,2,3-cd]pyrene	U		NA		U		U		U	
Isophorone	U		NA		U		U		U	
Naphthalene	0.07		NA		U		0.061	J	U	
Nitrobenzene	U		NA		U		U		U	
N-Nitroso-di-n-propylamine	U		NA		U		U		U	
N-Nitrosodiphenylamine	U		NA		U		U		U	
Pentachlorophenol			NA		NA		NA		NA	
Phenanthrene	0.23		NA		U		0.081	J	U	
Phenol			NA		NA		NA		NA	
Pyrene	0.36		NA		U		0.13	J	0.01	J
Total Petroleum Hydrocarbons										
Petroleum Hydrocarbons	130		NA		7.1		NA		NA	
PCBs										
Aroclor-1016	NA		NA		NA		U		U	
Aroclor-1221	NA		NA		NA		U		U	
Aroclor-1232	NA		NA		NA		U		U	
Aroclor-1242	NA		NA		NA		U		U	
Aroclor-1248	NA		NA		NA		U		0.032	JP
Aroclor-1254	NA		NA		NA		U		0.024	JP
Aroclor-1260	NA		NA		NA		U		U	
Metals										
Aluminum	NA		NA		NA		11300		NA	
Antimony	NA		NA		NA		5.5	JN	NA	
Arsenic	NA		NA		NA		97.6	*	NA	
Barium	NA		NA		NA		228		NA	
Beryllium	NA		NA		NA		0.57		NA	
Cadmium	NA		NA		NA		1		NA	
Calcium	NA		NA		NA		3060		NA	
Chromium	NA		NA		NA		28.6	N*	NA	
Cobalt	NA		NA		NA		14.1		NA	
Copper	NA		NA		NA		154	N*	NA	
Iron	NA		NA		NA		21100		NA	
Lead	NA		NA		NA		297	*	NA	
Magnesium	NA		NA		NA		1950		NA	
Manganese	NA		NA		NA		244	N	NA	
Mercury	NA		NA		NA		0.29		NA	
Nickel	NA		NA		NA		35.6	*	NA	
Potassium	NA		NA		NA		1070		NA	
Selenium	NA		NA		NA		0.55	J	NA	
Silver	NA		NA		NA		1.6		NA	
Sodium	NA		NA		NA		206	J	NA	
Thallium	NA		NA		NA		U		NA	
Vanadium	NA		NA		NA		37.6		NA	
Zinc	NA		NA		NA		470	*	NA	

Notes:
all results in mg/kg
Q = Data qualifier
J = Concentration is an estimated value
B = Analyte detected in method blank.
D = Concentration was reported from the diluted sample
P = Pesticide/PCB Qualifier - the detected concentration between two GC columns is greater than 25%.
N = Matrix spike recovery outside of control limits.
* = Duplicate analysis is outside of control limits.
U = Compound was not detected
NA = Not analyzed

Table M-4
Analytical Results for Excavation Area D

SITE	57(2)		S/T31.75		S/T31.75		S/T31.75		S/T31.75		S/T32		S32.5		SB420	
LOCATOR	57(2)/2.5-3.5		S/T31.75[0.5]		S/T31.75[2.0]		S/T31.75[4.0]		S/T31.75[8.0]		S/T32[2.0]		S32.5[2.0]		SB420-2.0	
SAMPLE NUMBER	2.5 - 3.5 ft		0 - 0.5 ft		1.5 - 2 ft		4 ft		8 ft		1.5 - 2 ft		1.5 - 2 ft		2 - 4 ft	
COLLECT DATE	01/24/1994		09/03/1992		09/03/1992		09/03/1992		09/03/1992		09/02/1992		09/02/1992		07/12/1999	
	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Semi-volatile Compounds																
1,2,4-Trichlorobenzene	NA		U		U		U		U		U		U		NA	
1,2-Dichlorobenzene	NA		U		U		U		U		U		U		NA	
1,3-Dichlorobenzene	NA		U		U		U		U		U		U		NA	
1,4-Dichlorobenzene	NA		U		U		U		U		U		U		NA	
2,2'-Oxybis(1-Chloropropane)	NA		U		U		U		U		U		U		NA	
2,4,5-Trichlorophenol	NA		NA		U		NA		NA		U		U		NA	
2,4,6-Trichlorophenol	NA		NA		U		NA		NA		U		U		NA	
2,4-Dichlorophenol	NA		NA		U		NA		NA		U		U		NA	
2,4-Dimethylphenol	NA		NA		U		NA		NA		U		U		NA	
2,4-Dinitrophenol	NA		NA		U		NA		NA		U		U		NA	
2,4-Dinitrotoluene	NA		U		U		U		U		U		U		NA	
2,6-Dinitrotoluene	NA		U		U		U		U		U		U		NA	
2-Chloronaphthalene	NA		U		U		U		U		U		U		NA	
2-Chlorophenol	NA		NA		U		NA		NA		U		U		NA	
2-Methylnaphthalene	NA		0.64 J		43 J		U		U		25 J		0.05 J		NA	
2-Methylphenol	NA		NA		U		NA		NA		U		U		NA	
2-Nitroaniline	NA		U		U		U		U		U		U		NA	
2-Nitrophenol	NA		NA		U		NA		NA		U		U		NA	
3,3'-Dichlorobenzidine	NA		U		U		U		U		U		U		NA	
3-Nitroaniline	NA		U		U		U		U		U		U		NA	
4,6-Dinitro-2-Methylphenol	NA		NA		U		NA		NA		U		U		NA	
4-Bromophenyl-phenylether	NA		U		U		U		U		U		U		NA	
4-Chloro-3-Methylphenol	NA		NA		U		NA		NA		U		U		NA	
4-Chloroaniline	NA		U		U		U		U		U		U		NA	
4-Chlorophenyl-phenylether	NA		U		U		U		U		U		U		NA	
4-Methylphenol	NA		NA		U		NA		NA		U		U		NA	
4-Nitroaniline	NA		U		U		U		U		U		U		NA	
4-Nitrophenol	NA		NA		U		NA		NA		U		U		NA	
Acenaphthene	NA		U		U		U		U		U		U		NA	
Acenaphthylene	NA		U		U		U		U		U		U		NA	
Anthracene	NA		U		U		U		U		U		0.097 J		NA	
Benzo[a]anthracene	NA		U		U		U		U		U		0.1 J		NA	
Benzo[a]pyrene	NA		U		U		U		U		U		0.15 J		NA	
Benzo[b]fluoranthene	NA		U		U		U		U		U		0.16 J		NA	
Benzo[g,h,i]perylene	NA		U		U		U		U		U		U		NA	
Benzo[k]fluoranthene	NA		U		U		U		U		U		0.12 J		NA	
bis(2-Chloroethoxy)methane	NA		U		U		U		U		U		U		NA	
bis(2-Chloroethyl)ether	NA		U		U		U		U		U		U		NA	
bis(2-Ethylhexyl)phthalate	180		11 BA		540 JBA		0.23 JBA		0.11 JB		700 BA		1.1 UB		61 U	
butylbenzylphthalate	NA		1.4 JB		130 JBA		0.045 JB		0.036 JB		51 JB		0.48 UB		61 U	
Carbazole	NA		U		U		U		U		U		U		NA	
Chrysene	NA		U		U		U		U		U		0.18 J		NA	
Dibenz[a,h]anthracene	NA		U		U		U		U		U		U		NA	
Dibenzofuran	NA		U		U		U		U		U		U		NA	
diethylphthalate	NA		U		U		U		U		U		0.029 J		61 U	
Dimethylphthalate	NA		U		U		U		U		U		U		NA	
Di-n-butylphthalate	NA		U		U		U		U		22 JB		0.22 JB		61 U	
Di-n-octylphthalate	NA		0.27 J		12 J		0.014 J		0.012 J		7.8 J		0.038 J		61 U	
Fluoranthene	NA		U		U		U		U		U		0.24 J		NA	
Fluorene	NA		U		U		U		U		U		U		NA	
Hexachlorobenzene	NA		U		U		U		U		U		U		NA	
Hexachlorobutadiene	NA		U		U		U		U		U		U		NA	
Hexachlorocyclopentadiene	NA		U		U		U		U		U		U		NA	
Hexachloroethane	NA		U		U		U		U		U		U		NA	
Indeno[1,2,3-cd]pyrene	NA		U		U		U		U		U		U		NA	
Isophorone	NA		U		U		U		U		U		U		NA	
Naphthalene	660		43		5800 E		0.4		0.15 J		1600		0.69 U		NA	
Nitrobenzene	NA		U		U		U		U		U		U		NA	
N-Nitroso-di-n-propylamine	NA		U		U		U		U		U		U		NA	
N-Nitrosodiphenylamine	NA		U		U		U		U		U		U		NA	
Pentachlorophenol	NA		NA		U		NA		NA		U		U		NA	
Phenanthrene	NA		0.67 J		U		U		U		12 J		1.6 U		NA	
Phenol	NA		NA		U		NA		NA		U		U		NA	
Pyrene	NA		U		U		U		U		U		0.24 J		NA	

Table M-4
Analytical Results for Excavation Area D

SITE	57(2)		S/T31.75		S/T31.75		S/T31.75		S/T31.75		S/T32		S32.5		SB420
LOCATOR	57(2)/2.5-3.5		S/T31.75[0.5]		S/T31.75[2.0]		S/T31.75[4.0]		S/T31.75[8.0]		S/T32[2.0]		S32.5[2.0]		SB420-2.0
SAMPLE NUMBER	2.5 - 3.5 ft		0 - 0.5 ft		1.5 - 2 ft		4 ft		8 ft		1.5 - 2 ft		1.5 - 2 ft		2 - 4 ft
COLLECT DATE	01/24/1994		09/03/1992		09/03/1992		09/03/1992		09/03/1992		09/02/1992		09/02/1992		07/12/1999
	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
PCBs															NA	
Aroclor-1016	U		U		U		U		U		U		U		NA	
Aroclor-1221	U		U		U		U		U		U		U		NA	
Aroclor-1232	U		U		U		U		U		U		U		NA	
Aroclor-1242	U		U		U		U		U		U		U		NA	
Aroclor-1248	0.39		U		U		U		U		U		U		0.039	UJ
Aroclor-1254	0.46		U		U		U		U		U		U		0.039	UJ
Aroclor-1260	U		U		U		U		U		U		U		NA	

Notes:
all results in mg/kg
Q = Data qualifier
J = Concentration is an estimated value
B = Analyte detected in method blank.
E = Concentration exceeds calibration range.
D = Concentration was reported from the diluted sample
A = Undefined
U = Compound was not detected
NA = Not analyzed

Table M-5
Analytical Data for Channel D Excavation Area

SITE	CM11		CM11		CM11		CM16		CM17		SED-7		SED-7		SED-8		SED-8		SED-9	
LOCATOR	CM11[0.5]		CM11[2.0]		CM11[4.0]		CM16/0.0-0.5		CM17/0.5-1.0		SED-7-0-6		SED7-12-24		SED-8-0-6		SED-8-0-6DUP		SED-9-0-6	
SAMPLE NUMBER	0 - 0.5 ft		1.5 - 2 ft		4 ft		0 - 0.5 ft		0.5 - 1 ft		0 - 0.5 ft		1 - 2 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft	
COLLECT DATE	09/15/1992		09/15/1992		09/15/1992		11/30/1994		30-Nov-94		17-Dec-98		12/17/1998		12/17/1998		12/17/1998		12/17/1998	
	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organics																				
1,1,1-Trichloroethane	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
1,1,2,2-Tetrachloroethane	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
1,1,2-Trichloroethane	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
1,1-Dichloroethane	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
1,2-Dichloroethene (Total)	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
1,2-Dichloropropane	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
2-Butanone	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
2-Hexanone	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
4-Methyl-2-pentanone	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Acetone	NA		NA		0.032		NA		NA		NA		NA		NA		NA		NA	
Benzene	NA		NA		0.023		NA		NA		0.62 U		0.59 U		0.89 U		0.9 U		0.82 U	
Bromodichloromethane	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Bromoform	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Bromomethane	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Carbon Disulfide	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Carbon Tetrachloride	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Chlorobenzene	NA		NA		0.054		NA		NA		NA		NA		NA		NA		NA	
Chloroethane	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Chloroform	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Chloromethane	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
cis-1,3-Dichloropropene	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Dibromochloromethane	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Dichloromethane	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Ethylbenzene	NA		NA		U		NA		NA		0.62 U		0.59 U		0.89 U		0.9 U		0.82 U	
Styrene	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Tetrachloroethene	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Toluene	NA		NA		U		NA		NA		0.62 U		0.59 U		0.89 U		0.9 U		0.82 U	
trans-1,3-Dichloropropene	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Trichloroethene	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Vinyl Chloride	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Xylenes (Total)	NA		NA		U		NA		NA		0.62 U		0.59 U		0.89 U		0.9 U		0.82 U	
Semi-volatile Compounds																				
1,2,4-Trichlorobenzene	NA		NA		U		U		0.48 J		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
1,2-Dichlorobenzene	NA		NA		U		U		1.4 J		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
1,3-Dichlorobenzene	NA		NA		U		U		1.8 J		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
1,4-Dichlorobenzene	NA		NA		U		U		2.7 J		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
2,2'-Oxybis(1-Chloropropane)	NA		NA		U		U		U		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
2,4,5-Trichlorophenol	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
2,4,6-Trichlorophenol	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
2,4-Dichlorophenol	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
2,4-Dimethylphenol	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
2,4-Dinitrophenol	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
2,4-Dinitrotoluene	NA		NA		U		U		U		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
2,6-Dinitrotoluene	NA		NA		U		U		U		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
2-Chloronaphthalene	NA		NA		U		U		U		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
2-Chlorophenol	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
2-Methylnaphthalene	NA		NA		U		U		0.4 J		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
2-Methylphenol	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
2-Nitroaniline	NA		NA		U		U		U		2 U		1.9 U		2.7 U		2.9 U		2.4 U	
2-Nitrophenol	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
3,3'-Dichlorobenzidine	NA		NA		U		U		U		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
3-Nitroaniline	NA		NA		U		U		U		2 U		1.9 U		2.7 U		2.9 U		2.4 U	
4,6-Dinitro-2-Methylphenol	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
4-Bromophenyl-phenylether	NA		NA		U		U		U		NA		NA		NA		NA		NA	
4-Chloro-3-Methylphenol	NA		NA		U		NA				NA		NA		NA		NA		NA	
4-Chloroaniline	NA		NA		U		U		U		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
4-Chlorophenyl-phenylether	NA		NA		U		U		U		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
4-Methylphenol	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
4-Nitroaniline	NA		NA		U		U		U		2 U		1.9 U		2.7 U		2.9 U		2.4 U	
4-Nitrophenol	NA		NA		U		NA		NA		NA		NA		NA		NA		NA	
Acenaphthene	NA		NA		U		U		U		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
Acenaphthylene	NA		NA		U		U		U		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	
Anthracene	NA		NA		U		U		U		0.12 J		0.11 U		0.16 U		0.17 U		0.14 U	
Benzo[a]anthracene	NA		NA		U		U		U		0.14		0.091 J		0.16 U		0.17 U		0.14 U	
Benzo[a]pyrene	NA		NA		U		U		U		0.097 J		0.083 J		0.16 U		0.17 U		0.14 U	
Benzo[b]fluoranthene	NA		NA		U		U		U		0.27		0.13		0.16 U		0.17 U		0.14 U	
Benzo[g,h,i]perylene	NA		NA		U		U		U		0.09 J		0.05 J		0.16 U		0.17 U		0.14 U	
Benzo[k]fluoranthene	NA		NA		U		U		U		0.1 J		0.045 J		0.16 U		0.17 U		0.14 U	
bis(2-Chloroethoxy)methane	NA		NA		U		U		U		0.12 U		0.11 U		0.16 U		0.17 U		0.14 U	

Table M-5
Analytical Data for Channel D Excavation Area

SITE	CM11	CM11	CM11	CM16	CM17	SED-7	SED-7	SED-8	SED-8	SED-9
LOCATOR	CM11[0.5]	CM11[2.0]	CM11[4.0]	CM16/0.0-0.5	CM17/0.5-1.0	SED-7-0-6	SED7-12-24	SED-8-0-6	SED-8-0-6DUP	SED-9-0-6
SAMPLE NUMBER	0 - 0.5 ft	1.5 - 2 ft	4 ft	0 - 0.5 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
COLLECT DATE	09/15/1992	09/15/1992	09/15/1992	11/30/1994	30-Nov-94	17-Dec-98	12/17/1998	12/17/1998	12/17/1998	12/17/1998
	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q
bis(2-Chloroethyl)ether	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
bis(2-Ethylhexyl)phthalate	NA	NA	1.8 B	880	39	51 D	80 D	12 D	2.3 J	0.1 J
Butyl benzyl phthalate	NA	NA	U	U	U	0.073 J	0.11 U	0.16 U	0.17 U	0.14 U
Carbazole	NA	NA	U	U	U	0.11 J	0.11 U	0.16 U	0.17 U	0.14 U
Chlorinated Biphenyl, Isomer	NA	NA	NA	NA	NA	NA	0.63 J	NA	NA	NA
Chrysene	NA	NA	U	U	U	0.31	0.086 J	0.16 U	0.17 U	0.14 U
Dibenz[a,h]anthracene	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
Dibenzofuran	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
Diethylphthalate	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
Dimethylphthalate	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
Di-n-butylphthalate	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
Di-n-octylphthalate	NA	NA	0.049 J	76 J	2.1 J	2.8	3.7	0.32 J	0.17 UJ	0.14 U
Fluoranthene	NA	NA	U	U	U	1.2	0.16	0.16 U	0.17 U	0.056 J
Fluorene	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
Hexachlorobenzene	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
Hexachlorobutadiene	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
Hexachlorocyclopentadiene	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
Hexachloroethane	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
Indeno[1,2,3-cd]pyrene	NA	NA	U	U	U	0.087 J	0.057 J	0.16 U	0.17 U	0.14 U
Isophorone	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
Naphthalene	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
Nitrobenzene	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
N-Nitroso-di-n-propylamine	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
N-Nitrosodiphenylamine	NA	NA	U	U	U	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
P-Bromodiphenyl Ether	NA	NA	NA	NA	NA	0.12 U	0.11 U	0.16 U	0.17 U	0.14 U
Pentachlorophenol	NA	NA	U	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	U	U	U	0.35	0.063 J	0.16 U	0.17 U	0.14 U
Phenol	NA	NA	U	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	U	U	U	0.7	0.15	0.16 U	0.17 U	0.14 U
Unknown	NA	NA	NA	NA	NA	NA	0.64 J	0.42 J	54 J	0.19 J
Unknown Acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.31 J
Unknown Alcohol	NA	NA	NA	NA	NA	NA	NA	1 J	1.1 J	NA
Unknown Alcohol1	NA	NA	NA	NA	NA	NA	NA	NA	1.3 J	NA
Unknown Alkane	NA	NA	NA	NA	NA	1.4 J	2.7 J	0.47 J	0.43 J	1.9 J
Unknown Alkane1	NA	NA	NA	NA	NA	NA	2.9 J	0.82 J	NA	0.46 J
Unknown Alkane2	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.52 J
Unknown Alkene	NA	NA	NA	NA	NA	0.6 J	2.2 J	NA	NA	NA
Unknown Aromatic	NA	NA	NA	NA	NA	1.6 J		NA	NA	NA
Unknown Carboxylic Acid	NA	NA	NA	NA	NA	1.3 J	0.77 J	0.26 J	NA	NA
Unknown Carboxylic Acid1	NA	NA	NA	NA	NA	0.6 J	0.79 J	0.35 J	NA	NA
Unknown Carboxylic Acid2	NA	NA	NA	NA	NA	0.67 J	0.85 J	2.5 J	NA	NA
Unknown Carboxylic Acid3	NA	NA	NA	NA	NA	0.76 J	0.88 J	2.8 J	NA	NA
Unknown Carboxylic Acid4	NA	NA	NA	NA	NA	2 J	1.8 J	NA	NA	NA
Unknown Carboxylic Acid5	NA	NA	NA	NA	NA	2.5 J	3.9 J	NA	NA	NA
Unknown Carboxylic Acid6	NA	NA	NA	NA	NA	2.9 J	NA	NA	NA	NA
Unknown Carboxylic Acid7	NA	NA	NA	NA	NA	10 J	NA	NA	NA	NA
Unknown Carboxylic Acid8	NA	NA	NA	NA	NA	0.96 J	NA	NA	NA	NA
Unknown Ketone	NA	NA	NA	NA	NA	3.5 J	0.58 J	2 J	NA	NA
Unknown Ketone1	NA	NA	NA	NA	NA	NA	NA	0.44 J	NA	NA
Unknown Ketone2	NA	NA	NA	NA	NA	NA	NA	0.35 J	NA	NA
Unknown1	NA	NA	NA	NA	NA	NA	3.2 J	0.25 J	1.8 J	0.19 J
Unknown10	NA	NA	NA	NA	NA	NA	NA	1.7 J	NA	NA
Unknown11	NA	NA	NA	NA	NA	NA	NA	0.24 J	NA	NA
Unknown12	NA	NA	NA	NA	NA	NA	NA	3.5 J	NA	NA
Unknown13	NA	NA	NA	NA	NA	NA	NA	6.4 J	NA	NA
Unknown14	NA	NA	NA	NA	NA	NA	NA	10 J	NA	NA
Unknown2	NA	NA	NA	NA	NA	NA	NA	0.28 J	0.84 J	0.19 J
Unknown3	NA	NA	NA	NA	NA	NA	NA	0.3 J	0.77 J	0.21 J
Unknown4	NA	NA	NA	NA	NA	NA	NA	0.32 J	0.61 J	0.46 J
Unknown5	NA	NA	NA	NA	NA	NA	NA	0.34 J	0.46 J	NA
Unknown6	NA	NA	NA	NA	NA	NA	NA	0.35 J	0.37 J	NA
Unknown7	NA	NA	NA	NA	NA	NA	NA	0.7 J	1.5 J	NA
Unknown8	NA	NA	NA	NA	NA	NA	NA	0.8 J	NA	NA
Unknown9	NA	NA	NA	NA	NA	NA	NA	1.3 J	NA	NA
Total Petroleum Hydrocarbons										
Total Petroleum Hydrocarbons	NA	NA	NA	NA	NA	190	430	40	46	31

Table M-5
Analytical Data for Channel D Excavation Area

SITE	CM11	CM11	CM11	CM16	CM17	SED-7	SED-7	SED-8	SED-8	SED-9
LOCATOR	CM11[0.5]	CM11[2.0]	CM11[4.0]	CM16/0.0-0.5	CM17/0.5-1.0	SED-7-0-6	SED7-12-24	SED-8-0-6	SED-8-0-6DUP	SED-9-0-6
SAMPLE NUMBER	0 - 0.5 ft	1.5 - 2 ft	4 ft	0 - 0.5 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
COLLECT DATE	09/15/1992	09/15/1992	09/15/1992	11/30/1994	30-Nov-94	17-Dec-98	12/17/1998	12/17/1998	12/17/1998	12/17/1998
	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q
PCBs										
Aroclor-1016	U	U	U	U	U	0.4 U	0.37 U	0.054 UJ	0.057 U	0.047 UJ
Aroclor-1221	U	U	U	U	U	0.4 U	0.37 U	0.054 UJ	0.057 U	0.047 UJ
Aroclor-1232	U	U	U	U	U	0.4 U	0.37 U	0.054 UJ	0.057 U	0.047 UJ
Aroclor-1242	U	U	U	U	U	0.4 U	0.37 U	0.054 UJ	0.057 U	0.047 UJ
Aroclor-1248	0.39 P	0.51 P	0.028 JP	37	0.27	1.9	3	0.054 UJ	0.057 U	0.072 J
Aroclor-1254	0.14 JP	0.18 JP	U	U	U	0.4 U	0.37 U	0.054 UJ	0.057 U	0.047 UJ
Aroclor-1260	U	U	U	U	U	0.4 U	0.37 U	0.054 UJ	0.057 U	0.043 J
Metals										
Antimony	NA	NA	NA	NA	NA	0.189 J	0.155 UJ	0.225 UJ	0.238 UJ	0.317 J
Arsenic	NA	NA	NA	NA	NA	3.52 J	2.39 J	7.85 J	7.83 J	6.83 J
Beryllium	NA	NA	NA	NA	NA	0.29 J	0.188 J	0.759 J	0.595 J	0.252 J
Cadmium	NA	NA	NA	NA	NA	0.106 J	0.0286 U	0.0416 U	0.0439 U	0.0362 U
Chromium	NA	NA	NA	NA	NA	12.5 J	11.4 J	24.8 J	26.2 J	13 J
Copper	NA	NA	NA	NA	NA	31.4 J	43.8 J	20.9 J	20.1 J	31.8 J
Lead	NA	NA	NA	NA	NA	31.3	15.7	15	11.4	32.1
Mercury	NA	NA	NA	NA	NA	0.0633	0.0371 U	0.054 U	0.057 U	0.315
Nickel	NA	NA	NA	NA	NA	4.45 J	10.3 J	11.2 J	11 J	3.26 J
Selenium	NA	NA	NA	NA	NA	0.888 J	0.63 J	0.804 J	0.836 J	1.62 J
Silver	NA	NA	NA	NA	NA	0.0809 U	0.0749 U	0.109 U	0.115 U	0.197 J
Thallium	NA	NA	NA	NA	NA	0.662 J	1.5 J	0.908 J	0.945 J	0.479 J
Zinc	NA	NA	NA	NA	NA	21.9 J	29.2 J	38.3 J	30.7 J	14.2 J

Notes:
all results in mg/kg
Q = Data qualifier
J = Concentration is an estimated value
D = Concentration was reported from the diluted sample
N = Result was negated due to method, trip or field blank contamination
U = Compound was not detected
NA = Not analyzed